Architect's Stainless Steel Library

GUIDE SPECIFICATIONS

THE INTERNATIONAL NICKEL COMPANY, INC.

PREPARED IN COOPERATION WITH COMMITTEE OF STAINLESS STEEL PRODUCERS, AMERICAN IRON AND STEEL INSTITUTE

Architect's Stainless Steel Library

This third book, of a series of four, distributed to selected architectural offices, has been prepared by The International Nickel Company, in cooperation with the Committee of Stainless Steel Producers of the American Iron and Steel Institute.

Book III . . . Specifications . . . The book now in your hands contains Suggested Guide Specifications on stainless steel products, prepared for the convenience of architects, and specification writers by Ben H. Dyer, AIA-CSI, specifications consultant.

Book IV . . . Design Manual . . . Chemical, mechanical properties, product availability, charts, graphs, detail drawings, design suggestions, and information about the design-related characteristics of stainless steel. This volume is being prepared and will be distributed in 1966.

Book I . . . Finish Samples . . . Contains samples of currently available stainless steel standard mechanical and proprietary finishes.

Book II . . . A.I.S.I. Data Sheets . . . Contains architectural data sheets published by the Committee of Stainless Steel Producers, American Iron and Steel Institute.

*Note: Please keep Books No. 1, 2, and 3 together.

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Foreword

INTENT

These suggested Guide Specifications are offered to the construction industry to promote better specifications for Stainless Steel Products and to provide the Specification Writer with a comprehensive manuscript that will assist him in writing individual project specifications for the items described herein.

The "Notes to Specification Writer" are intended to serve as a check list for items that are not included in the text and also to explain some of the variables that must be determined for each project.

FORMAT & ARRANGEMENT

These Suggested Guide Specifications follow the format of the copyrighted AIA Specification Work Sheets with the consent of the American Institute of Architects.

The CSI Format For Building Specifications may be used as the basis for indexing and numbering the project specifications. This format requires each section to be identified by a number and a letter; the number is that of the fixed division under which the section is located; the letter is any letter beginning with "A" and continuing alphabetically as necessary.

SUGGESTIONS FOR USE

The Notes For Specification Writer which accompany each section contain background information and notes to assist the specification writer. Some of the notes are keyed to specific paragraphs in the text. It is intended that the copy of the specification text be marked-up and edited as necessary to suit specific requirements of the project. From this rough draft, the plates or stencils for the project specification may be typed. Additional work copies are available upon request, or photocopies of the printed originals may be made as desired.

The words, figures or clauses (in parenthesis) indicate a choice that must be made. Inapplicable words, figures and clauses should be omitted or revised to suit the project requirements. The blank spaces provided must be filled in to complete the information necessary.

NOTICE OF RESPONSIBILITY

The system and text presented herein, for these Suggested Guide Specifications require that the user fill in the blank spaces, make the changes, additions or deletions necessary to adapt them to his specific project conditions and requirements. The user must assume full responsibility for correctness of the finished specifications. No warranty, expressed or implied, is made and no responsibility is assumed by the Author, the International Nickel Company, Inc. or the American Iron and Steel Institute with respect to the use of these Suggested Guide Specifications.

These Suggested Guide Specifications shall not be made a part of any specification or contract by reference.

ACKNOWLEDGEMENTS

Product manufacturers and individuals have reviewed drafts of the Suggested Guide Specifications. Their comments and recommendations have been incorporated into each final Guide Specification.

Suggested Guide Specifications for

Stainless Steel Revolving Doors

Notes for Specification Writer

GENERAL NOTES

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used for numbering the project specifications, the Stainless Steel Revolving Door Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Door, Windows and Glass" and be numbered accordingly.

It may be necessary at times to combine Revolving Doors with another trade section of the project specification, or to include other items such as Swinging Doors in this Section. Before combining Revolving Doors with other work, consider the manner in which sub-bids may be submitted and also the responsibility for installation of the combined work.

On projects where swinging doors, curtain wall, window wall or glass store front construction occurs adjacent to stainless steel revolving doors, the correct division of specification sections and work included under subcontracts may become complicated. When parts of the work such as frames, adjacent trim or structural supports are to be included in other sections, the necessary coordination and cross references should be provided and the responsibility for matching finishes should be clearly defined.

The text of these Suggested Guide Specifications is prepared and arranged on the basis that the Revolving Doors will be a separate trade section of the project specifications and the work will be performed as a subcontract under a General Contractor. Therefore, all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the text should be modified accordingly.

NOTES FOR SPECIFIC ITEMS

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade. Such a list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings and schedules clearly indicate the extent and location of all items to be included under this section, the entire paragraph could be omitted.

NOTE 2: It is intended that the name of door manufacturer, model or series number of door unit and all specialty items and accessories be included in this paragraph. Refer to manufacturers' catalogs for special and optional features. When listing acceptable or optional manufacturers, check and verify that the manufacturers listed can produce the items as specified. In addition, the manufacturers listed should produce doors and frames of comparable quality and in similar price ranges.

NOTE 3: Before specifying the location for the speed regulator unit (overhead or floor type), refer to manufacturers' catalogs for recommendations and limitations.

When speed regulator is placed in floor, it will not

permit shaft and wings to be moved to the side of the enclosure.

Where floor supported doors are selected and head room is limited and/or a transom panel is located above center of door, a floor type speed control should be specified.

Where enclosures are completely built-in and overhead speed regulators are used, suitable flush access panels should be provided in ceiling of enclosure.

Electric motor drives (single-speed or two-speed) are available as an optional feature. When motor drives are used, check the mechanism size and location against available space and make provision for electric wiring.

NOTE 4: In most cases it is customary for the glass in revolving door wings and enclosure walls to be furnished and installed as a part of the door contract. This procedure assures a proper fit for the curved glass enclosure and the proper notching, cutouts and drilling of the glass wings. Glass for transoms, sidelights and other adjacent glass enclosures may be included as a part of this section, or under section "Glass and Glazing". On projects where it is necessary to have glass furnished or installed under another trade, the paragraphs herein on "Glass" and "Glazing" should be revised.

NOTE 5: Since the glass for revolving door wings and the curved glass for the door enclosure walls require careful forming, cutting and fitting, it is desirable to include the glass installation as a part of the revolving door contract. Where local practice does not permit this arrangement, revise the specifications accordingly and omit "Glazing" from this section.

Note the two sub-paragraphs (1) under "Glazing". The first sub-paragraph (1) is to be used when the materials and methods for glazing are described herein; other types of compounds and methods may also be required. The second sub-paragraph (1) is to be used when the materials and methods for glazing revolving doors are adequately described under section "Glass and Glazing" of the project specifications and the work is included as part of the door contract by cross reference.

NOTE 6: The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the Revolving Door Sub-Contract. However, the final cleaning is specified to be included under another section of the project specifications. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the Work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" or "Special Conditions" Sections of the project specifications.

When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish used should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

Issued: October 1963
Revised: January 1966

Stainless Steel Revolving Doors

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing stainless steel revolving doors ..... and related items necessary to complete the work indicated and specified.

SEE NOTE 1

(B) ITEMS INCLUDED: In general the work shall include the following items:

(1) Stainless steel revolving doors at openings No. ....., complete with accessories specified.
(2) Adjacent stainless steel frames for transoms, sidelights, glass enclosures and ..... as indicated.
(3) Concealed structural steel reinforcing members for frames as indicated.
(4) Glass and metal glazing beads for doors, door enclosure, (transoms)—(sidelights) and ....
(5) Installation of doors, door frames and enclosure, framing, hardware, glass and accessories, except as otherwise specified.
( ) .....

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications:

(1) Glass and glazing, except as specified herein: in section No. .....
(2) Electric conduit and wiring in connection with (ceiling lights)—(power driven motors) for revolving doors: in section No. .....
(3) Lock cylinders: in section No. .....
(4) Structural supports at mullions and ..... except as specified: in section No. .....
(5) Caulking except, as specified herein: in section No. .....
(6) Final cleaning of glass: in section No. .....
( ) .....

(D) ALTERNATES: Note that alternate No. ..... affects the work required under this section. Refer to Bid Form and to section No. ..... for a detailed description of the alternates required.

2. SHOP DRAWINGS:

(A) Submit ..... copies of shop drawings for revolving doors and accessories to Architect for approval. Submit drawings in accordance with requirements described in section No. ..... General Conditions. Obtain approval of drawings prior to proceeding with manufacturing. Shop drawings shall indicate elevations of each door; details of door and frame; methods of assembling, fastening and anchoring; location and installation requirements for hardware and speed control mechanism, size, shape and thickness of materials; joints and connections with other work, and .....
.....

3. SAMPLES:

(A) Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements stated in section No. ..... General Conditions.

(1) Samples approximately 3 by 6 inch size of stainless steel in each finish specified.
(2) Sample approximately 6 by 6 inch size of each type of glass specified herein.
(3) Samples of .....

4. REVOLVING DOORS:

SEE NOTE 2

(A) TYPE AND MANUFACTURER: Revolving doors at opening nos. ..... shall be model No. ....., stainless steel as manufactured by ..... and of sizes and design indicated. Similar doors as manufactured by ..... or ..... may be used, provided they comply with requirements indicated and specified.

(1) Door wings shall have automatic panic collapsing mechanism and be (floor supported with fixed center shaft and overhead type speed control)—(overhead supported with rollaside feature and overhead type speed control). Doors shall be complete with curved enclosure walls, flat ceiling, ceiling lights, hardware, glass, weatherstripping, (adjoining trim as indicated) and other accessories as specified.

(B) METAL AND FINISH: All exposed metal for doors, enclosure walls, ceilings, and ..... shall be mechanically leveled stainless steel, conforming to ASTM Specification A 167-63, Type 302 or Type 304, with manufacturer's standard No. 4 or No. ..... smooth satin finish to match approved sample. Stainless steel for bars, bolts, screws and fastenings shall be of type recommended by the manufacturer and of color and finish to match the adjacent surfaces. Except as otherwise indicated or specified, the minimum thickness of stainless steel shall be (16 USS gauge)—(14 USS gauge) for use in doors and (16 USS gauge)—(14 USS gauge) for use in frames, door enclosure walls and .....

(C) CONSTRUCTION AND WORKMANSHIP: Door stiles and rails, frame members and .... shall be of formed welded construction. Joints shall be carefully machined and fitted tight. Welds on exposed surfaces shall be dressed smooth and have same color and finish as the stainless steel. Provide reinforcing at corners and intersections and for hardware and operating mechanism. Provide concealed reinforcing or framing members and concealed steel shapes as required to maintain stability and in accordance with manufacturer's standard practice. Provide removable stainless steel glazing beads for all openings requiring glass. Miter and neatly fit beads at corners and secure to frames with oval head countersunk machine screws; space screws approximately 12 inches apart.

(D) PANIC COLLAPSING MECHANISM: Each wing shall be equipped with an automatic panic collapsing mechanism that will permit the wings to fold on each other outward in the line of egress and provide a clear exit on each side of the center shaft. The mechanism shall be designed to collapse the wings when a pressure of 60 pounds, but not more than 180 pounds, is applied on the outer stile at any point 42 inches or more above the floor. Braces, arms, chains or cables shall not be used between wings. The mechanism shall be easily adjustable, but its maximum tension shall not prevent collapse of wings.

SEE NOTE 3 (E) SPEED CONTROL: The speed rotation for the wings shall be controlled by a mechanical speed regulator placed (overhead)—(in the floor). The regulator shall permit free rotation of wings up to a predetermined rate of speed, but not exceeding 12 RPM.

(F) HARDWARE: Doors shall be provided with locks and pushbars. Locks shall be (keyed alike)—(master-keyed with cylinders furnished to the door manufacturer by .....). Provide two locks for each revolving door assembly. Pushbars shall be of stainless steel with a satin finish, or brass with a chrome plated satin finish over nickel and in manufacturer's standard design and sizes. Provide one pushbar on each door wing.

(G) WEATHERSTRIPS: Each door wing shall be equipped with flexible weatherstrips at top, bottom and at inner and outer stile edge. Material for weatherstrip shall be rubber, felt, or other suitable material standard with the door manufacturer. Secure the weatherstrips to door in a manner that will permit convenient adjustment and replacement.

(H) CEILING LIGHTS: Provide two recessed lights in each revolving door ceiling. Lights shall be complete with reflectors and ⅛ inch removable frosted glass cover. The face of glass cover retainer shall finish flush with ceiling and no part of the light shall extend below ceiling line.

SEE NOTE 4 (I) GLASS: Glass in connection with revolving doors, door enclosure walls, (transom)—(adjacent fixed glass sidelights) and ..... shall be cut and shaped to fit the openings and furnished with the doors. Glass shall conform to the applicable requirements of Federal Specification DD-G-45la, glazing quality, and be furnished in the following type and thickness.

(1) DOOR WINGS: (Polished plate)—(Tempered plate)—(Tinted polished plate)—(Tinted tempered plate), (¼)—(⅜)—(½) inch thick.

(2) DOOR ENCLOSURE WALLS: (Polished plate)—(Tinted polished plate), (¼)–(⅜)–(½) inch thick, and accurately bent to the required radius.

(3) TRANSOM, SIDELIGHTS and .....: (Polished plate)—(Tempered plate)—(Tinted polished plate)—(Tinted tempered plate), (¼)—(⅜)—(½) inch thick.

SEE NOTE 5 (J) GLAZING: Glass specified to be furnished and installed under this section for door wings, door enclosure walls and..... shall be installed under the direction of the door manufacturer.

(1) Support bottom of glass on neoprene, lead or hardwood setting blocks of proper size and shape; provide spacer shims of similar material on all sides of glass. The entire glazing rabbet around glass shall be completely filled to sight lines with (elastic glazing compound conforming to Federal Specification TT-P-78la, Type 1)–(single component type synthetic-rubber base glazing sealant conforming to Federal Specification TT-S-00230). Strip excess compound from glass and frame and tool at a slight angle to shed water.

OR

(1) The method of installation and the type of glazing compounds to be used shall be as specified for exterior metal doors under the "Glass and Glazing" section of the project specifications.

(K) INSTALLATION: Doors shall be installed by the manufacturer or his authorized representatives. Installation shall be in accordance with manufacturer's directions and approved shop drawings. Upon completion, doors and speed control shall be adjusted to work properly.

SEE NOTE 6

5. PROTECTION AND CLEANING:

(A) PROTECTION: Protect doors, frames and accessories from damage of any kind during handling, transportation and at the job site. Remove any protective tape coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect doors and frames from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance. Replace any broken glass.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel doors and frames shall have all smears of compounds, tapes and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturers of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel surfaces is included in another section of the project specification and is not a part of the revolving door contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish Owner with complete maintenance instructions for adjusting mechanism of doors and for cleaning and maintaining exposed metal surfaces.

Suggested Guide Specifications for

Stainless Steel Sliding Doors and Frames

Notes for Specification Writer

GENERAL NOTES:

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used for numbering the project specifications, the Stainless Steel Sliding Doors and Frames Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Doors, Windows and Glass" and be numbered accordingly.

It may be necessary at times to combine Sliding Doors with another trade section of the project specification, or to include other items such as Swinging Doors in this Section. Before combining Sliding Doors with other work, consider the manner in which sub-bids may be submitted and also the responsibility for installation of the combined work.

On projects where swinging doors, curtain wall, window wall or glass store front construction occurs adjacent to stainless steel sliding doors, the correct division of specification sections and work included under subcontracts may become complicated. When parts of the work such as frames, adjacent trim or structural supports are to be included in other sections, the necessary coordination and cross references should be provided and the responsibility for matching finishes should be clearly defined.

These Suggested Guide Specifications are prepared on the basis that the Stainless Steel Sliding Door work will be a subcontract under a General Contractor and all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the necessary revisions should be made.

NOTES FOR SPECIFIC ITEMS:

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade. Such a list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings and schedules clearly indicate the extent and location of all items to be included under this section, the entire paragraph could be omitted.

NOTE 2: It is intended that the name of door manufacturer, model or series number of door unit and all specialty items and accessories be included in this paragraph. Refer to manufacturers' catalogues for special and optional features. When listing acceptable or optional manufacturers, check and verify that the manufacturers listed can produce the items as specified. In addition, the manufacturers listed should produce doors and frames of comparable quality and in similar price ranges.

NOTE 3: The manufacturers of stainless steel doors and frames utilize many different methods of construction and type and gauges of metal to produce the finished

door. Therefore, these Suggested Guide Specifications have been prepared in a manner that will make the Manufacturer's own published specifications for the doors specified the basis for the Construction Requirements. The manufacturer's specification should be modified by the project specifications to suit job conditions. Where modifications are not required, the corresponding subparagraphs of these Suggested Guide Specifications may be omitted in many cases.

When a manufacturer's specification is made a part of the project specification by reference, a copy of the Referenced Manufacturer's Specification should be made available to bidders during the bidding period and a copy should be available at the project site during the construction period.

NOTE 4: In locations where sustained wind pressures greater than 20 pounds per square foot are anticipated, the requirements should be changed to strengthen the doors in accordance with manufacturer's recommendations and local conditions.

When conditions require that doors meet specific performance requirements such as Air Infiltration Tests; Water Infiltration Tests, Uniform and Concentrated Load Tests, the door manufacturer should be requested to furnish complete data on the required tests.

NOTE 5: The requirements herein for glazing in doors and adjacent panels are based upon glass installation being done in the field; when doors are to be factory glazed, the necessary revisions should be made.

Both metal glazing beads and flexible glazing channels have been included for securing glass in place. Before specifying only one method, check with door manufacturer to determine which method is available. Before specifying insulating glass, check with door manufacturer to determine the maximum thickness, weight and sizes recommended for the doors.

NOTE 6: The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the Sliding Door Sub-Contract. However, the final cleaning is specified to be included under another section of the project specification. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" or "Special Conditions" Section of the project specifications.

When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

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Stainless Steel Sliding Doors and Frames

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel sliding glass doors, door frames, framing, ... and related items necessary to complete the work indicated on drawings and described in specifications.

SEE NOTE 1

(B) ITEMS INCLUDED: In general the work to be performed under this section shall include the following items:

(1) Stainless steel horizontal sliding glass door panels; fixed glass door panels (transom and sidelight panels) and stainless steel frames at opening Nos. . . . . .
(2) Stainless steel framed sliding screens for sliding door panels at opening Nos. . . . . .
(3) All hardware for doors and screens as specified.
(4) Weatherstripping as specified.
(5) Concealed structural steel reinforced members as indicated for frames and framing members.
(6) Metal, vinyl or neoprene glazing beads or channels for securing glass in place.
(7) Installation of all items specified, unless designated otherwise.
(8) Initial cleaning of stainless steel.
( ) . . . . . .

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications.

(1) Glass and glazing: in Section No. . . . . .
(2) Master keyed lock cylinders: in Section No. . . . . .
(3) Structural supports at mullions and . . . . . , except as specified: in Section No. . . . . .
(4) Caulking except, as specified herein: in Section No. . . . . .
(5) Final cleaning of glass and stainless steel: in Section No. . . . . .
(6) Stainless steel elevator doors and frames: in Section No. . . . . .
(7) Stainless steel revolving doors: in Section No. . . . . .
(8) Stainless steel rolling doors and grilles: in Section No. . . . . .
( ) . . . . . .

(D) ALTERNATES: Note that alternate No. . . . . affects the work required under this section. Refer to Bid Form and to Section No. . . . . for a detailed description of the alternates required.

2. SHOP DRAWINGS:

(A) Submit . . . . . copies of shop drawings for all items specified herein to Architect for approval. Obtain approval of drawings prior to proceeding with manufacturing. Shop drawings shall indicate: elevations of each door type; designation of sliding and fixed panels; details of each frame type; location of screens; glass

thickness required; sizes of structural subframes and reinforcing members; methods of assembling, fastening and anchoring; location and installation requirements for hardware; size, shape and thickness of materials; joints and connections with other work;—and .....
.....

3. SAMPLES:

(A) Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements as stated in Section No. ..... General Conditions.

(1) Samples approximately 3 by 6 inch size of stainless steel in each finish specified.
(2) Samples (or cuts) of each item of hardware proposed for use.
(3) Corner section sample of door, screen, glazing beads or glazing gaskets.
( ) .....

4. SLIDING GLASS DOORS AND FRAMES:

SEE NOTE 2

(A) TYPE AND MANUFACTURER: Horizontal sliding doors at opening Nos. ..... shall be model No. ..... stainless steel and glass doors and stainless steel frames as manufactured by .... Similar type doors as manufactured by ..... or .... may be used, provided they comply with requirements indicated and specified.

(1) Doors shall be complete with sliding panels, fixed panels, screen panels, frames, framing members, hardware, tracks, sills, (transoms)—(adjoining sidelights)—(adjoining trim) and other accessories as indicated or specified. Doors and panels shall be of sizes and arrangement indicated.

SEE NOTE 3

(B) CONSTRUCTION REQUIREMENTS: Doors, frames, hardware and accessories shall be constructed in accordance with the current published specifications of the Door Manufacturer for the type, series or model No. of the item listed, with modifications and other requirements as indicated on project drawings and described in project specifications. (The requirements indicated on the project drawings or described in the project specifications shall take precedence over any similar requirements described in the above referenced Manufacturer's Specifications.)

(C) TYPE OF METAL, FINISH AND FASTENINGS: All exposed metal for doors, frames, framing members and ..... shall be mechanically leveled stainless steel, conforming to ASTM Specification A 167-63, Type 302 or Type 304. All bolts, screws and fastenings in finished work shall be stainless steel.

(1) Surfaces of stainless steel exposed to view as finish work shall have (a smooth satin finish) —(a .....finish) to match approved sample. Stainless steel for concealed reinforcing and other surfaces that are not exposed to view, shall not require any special finish.

(D) GAUGES OF METAL: The metal thickness of stainless steel for the items listed shall be of the following minimum U.S. Standard gauges:

(1) Face sheets for door stiles and rails: ..... gauge.
(2) Door frames, head, jamb & sill: ..... gauge.
(3) Mullions, transom bars and .....: ..... gauge.
(4) Glazing beads, when fabricated of metal: ..... gauge.
(5) Face sheets for insect screen frames: ..... gauge.
(6) Applied trim where so indicated: ..... gauge.

(E) WORKMANSHIP: The finished work shall be rigid, neat in appearance and free from defects. Shapes shall be accurately formed to required sizes and profiles with joints carefully fitted tight. Joining may be done by either concealed mechanical fastenings or by welding and in a manner to produce rigid watertight joints. When welding is used, it shall be done in a manner that will not leave blemishes on exposed surfaces. Welded joints on exposed surfaces shall be dressed smooth and have same color and finish as the adjacent stainless steel. Exposed screws or bolts will be permitted only at inconspicuous locations, and shall have heads countersunk.

(1) Frames shall be provided with anchors and fastenings of type, size and spacing (as indicated on project drawings)—(as indicated on approved shop drawings). Sill members shall be designed to provide drainage to the exterior.
(2) Door members shall be capable of sustaining, without permanent deformation or glass breakage, a uniformly distributed exterior static load of (20 pounds)—(..... pounds) per square foot of glazed area. SEE NOTE 4
(3) Door panels shall provide for adjustment to assure proper fit and operation, but without loss of weatherstripping qualities.

(F) WEATHERSTRIPPING: Sliding door panels shall be completely weatherstripped. The weatherstripping material shall be metal backed wool pile treated with silicone, flexible vinyl, or other suitable type that will be resistant to deterioration from weather or corrosion. Weatherstripping shall be designed for easy removal and replacement.

(G) PROVISIONS FOR GLAZING: Frames and panels shall be designed to receive glass of the following thickness: SEE NOTE 5

Sliding Door Panels: ..... inch thick (single

glass)—(. . . . . inch thick insulating glass).
Fixed Door Panels: . . . . . inch thick (single glass) —(. . . . . inch thick insulating glass).
Sidelights and Transoms: . . . . . inch thick (single glass)—(. . . . . inch thick insulating glass).
Provide removable metal glazing beads or flexible glazing gaskets for securing glass in frames. Metal glazing beads shall be stainless steel, designed for use with glazing tapes and glazing compounds and secured with screws. Flexible gaskets shall be vinyl or neoprene glazing channels of manufacturer's standard design and of proper size for the glass specified. Beads and gaskets shall be carefully fitted by mitering or coping at corners and corner joints shall be made by welding, vulcanizing or other approved methods to produce a watertight joint.

(H) HARDWARE: Sliding door and screen panels shall be fitted with hardware as follows:

(1) ROLLERS: Rollers for support of sliding panels shall consist of nylon-tired or other corrosion resistant sheaves with ball bearings that are self lubricating or pre-lubricated. Sheaves shall be adjustable to allow for proper alignment of the panels. Provide two sheaves for each panel.

(2) PULLS: Pulls shall be manufacturers' standard design, of stainless steel, or solid castings of a non-corrosive alloy and of color and finish to harmonize with the panel. (Wood, plastic or . . . . . may be used in combination with metal pulls as indicated.) Provide one pull on the inside and one on the outside of each sliding door and screen panel.

(3) LATCH: Latch shall be operable from inside only and be adjustable type, standard with the manufacturer. Provide one latch for (each sliding door panel)—(each pair of sliding door panels) at opening Nos. . . . . and for each sliding screen panel at opening Nos. . . . . .

(4) CYLINDER LOCKS: Cylinder locks shall be operable from either inside or outside and of type and design standard with the door manufacturer. Provide one cylinder lock for (each sliding door panel)—(each pair of sliding door panels) at opening Nos. . . . . (The lock cylinders shall be master keyed by the door manufacturer to fit the keying system of the building)—(The lock cylinders are included in Section "Hardware" of the project specifications and will be furnished to the door manufacturer for installation in the door locks.)

(I) INSECT SCREENS: One sliding insect screen panel shall be provided on the (outside)—(inside) of each sliding glass door panel at opening Nos. . . . . Screen panels will not be required for doors opening onto screened porches or . . . . . Screen panels shall consist of rolled-formed stainless steel lock-seam tubular sections not less than No. . . . . gauge. Provide concealed corner reinforcement as necessary to maintain strength and rigidity. Provide screens with rollers and other hardware as hereinbefore specified. The finish on screen frames shall be similar to doors. Screens shall fit closely and have suitable insect proofing around perimeter of each panel,and shall be easily removable.

(1) The screen frames shall have removable splines of vinyl or stainless steel. Screening material shall consist of (14 x 18 mesh vinylclad or plastic coated fiberglass of a standard color as selected) —(16 x 16 mesh, .009 inch diameter monel wire). Install screening with weave parallel with frames and sufficiently tight to present a smooth appearance. Edges of screening shall be concealed in the spline channel.

5. INSTALLATION OF DOORS, FRAMES AND ACCESSORIES:

(A) Doors, frames, framing members, hardware, and accessories shall be installed and adjusted by the manufacturer or his authorized representative; only experienced and qualified mechanics shall be used. Installation shall be in accordance with details on project drawings, manufacturer's directions and approved shop drawings. Door frames shall be set plumb and level and door panels shall retain proper weathering contact with frames. The finished work shall be rigid, neat in appearance and free from defects. Upon completion, doors shall be adjusted to operate properly.

6. PROTECTION AND CLEANING:

SEE NOTE 6

(A) PROTECTION: Protect doors, frames and accessories from damage of any kind during handling, transportation and at the job site. Remove any protective tape coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect doors and frames from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance. Replace any broken glass.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel doors and frames shall have all smears of compounds, tapes and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturer's of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel surfaces is included in another section of the project specification and is not a part of the sliding door contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish Owner with complete maintenance instructions for adjusting mechanism of doors and for cleaning and maintaining exposed metal surfaces.

Suggested Guide Specifications for

Stainless Steel Swinging Doors and Frames

Notes for Specification Writer

GENERAL NOTES:

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used for numbering the project specifications, the Stainless Steel Swinging Door Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Doors, Windows and Glass" and be numbered accordingly.

This section includes guide specifications for Full Glazed Stile and Rail Doors—Flush Doors—Tempered Glass Doors and Automatic Power Operators. At the expense of having some duplications, the text has been arranged to describe the doors, frames, finish, hardware, glass, workmanship and accessories for each type of door under the same sub-title or heading as the type of door listed. This arrangement of text will make the specifications easy to use; it will help avoid confusion between the many different types of construction and accessories for each door type; door types that are not needed for a project specification may easily be crossed out and omitted without disturbing the door types to be included.

It may be necessary at times to combine certain items of these Suggested Specifications under another trade section of the project specification, or to include other items in this Section. Before combining this section with other work, consider the manner in which sub-bids may be submitted and also the responsibility for installation of the combined work. Tempered glass doors with stainless steel shoes and fittings are included herein, but in some locations they are specified under the Glass and Glazing Section of the project specification.

These Suggested Specifications are prepared on the basis that the Stainless Steel Door and Frame work will be a subcontract under a General Contractor and all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the necessary revisions should be made.

NOTES FOR SPECIFIC ITEMS:

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade. Such a list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings and schedules clearly indicate the extent and location of all items to be included under this section, the entire paragraph could be omitted. It should be noted that these Suggested Guide Specifications include door hardware, automatic door operators and in some cases, glass as a part of the door work. The final decision concerning the proper place to specify these particular items will depend upon individual job conditions and local practice; the user must determine whether to include them with the doors or under another section. Refer also to notes 4, 5 and 7 herein.

NOTE: 2: It is intended that the name of door manufacturer, model or series number of door unit and all specialty items and accessories be included in this paragraph. Refer to manufacturers' catalogues for special and optional features. When listing acceptable or optional manufacturers, check and verify that the manufacturers listed can produce the items as specified. In addition, the manufacturers listed should produce doors and frames of comparable quality and in similar price ranges.

On projects where curtain wall, window wall or glass store front construction occurs adjacent to stainless steel entrance doors, the correct division of specification sections and work included under sub-contracts may become complicated. In such cases, sub-paragraph (1) should be revised as necessary.

NOTE 3: The manufacturers of stainless steel doors and frames utilize many different methods of construction and type and gauges of metal to produce the finished door. Some of the methods used and the suggested minimum U.S. Std. gauges of stainless steel are:

Stainless steel hollow metal construction: 16 gauge.
Stainless steel face sheets over honeycomb core: 22 gauge.
Stainless steel face sheets over solid fire retardent plastic core: 22 gauge.
Stainless steel clad over extruded aluminum shapes: 20 gauge.
Stainless steel clad over steel frame: 18 gauge.
Stainless steel clad over wood core: 22 gauge.
Formed stainless steel top and bottom rails for tempered glass doors: 16 gauge.
Stainless steel roll formed or brake formed sections: 18 gauge.
Stainless steel extrusions.

With this range of construction methods and metal thicknesses it would be impractical to prepare a specification that would suit all manufacturers and conditions. Therefore, these Suggested Guide Specifications have been prepared in a manner that will make the Manufacturer's own published specifications for the doors specified the basis for the Construction Requirements.

The manufacturer's specification should be modified by the project specifications to suit individual job conditions.

Where modifications are not required, the corresponding sub-paragraphs of these Suggested Guide Specifications may be omitted in many cases.

When a manufacturer's specification is made a part of the project specification by reference, a copy of the Referenced Manufacturer's Specification should be made available to bidders during the bidding period and a copy should be available at the project site during the construction period.

NOTE 4: Generally the glass and glazing for doors, sidelights, transoms etc. is specified in Section "Glass and Glazing" of the project specifications; however, in some localities and under certain conditions, glass may be specified with the doors. Generally, the only reason to specify glass with the doors would be in cases where the strength of the door is dependent upon the glass used, or where the type of door construction and method of glazing requires factory installation of glass.

NOTE 5: The workmanship requirements described herein permit joining by either welding or concealed mechanical fastenings. However, when special textured, patterned, dull, or colored finishes of stainless steel are specified, the type of construction used must avoid welding or dressing on exposed surfaces. Such finishes cannot be matched after welding and dressing.

NOTE 6: These Suggested Guide Specifications have been prepared on the basis that the hardware for stainless steel doors will be specified under this section and furnished with the doors and frames. The preparation of doors and frames to receive the hardware specified is also included herein.

The items of hardware required for each door or sets of doors included herein should be listed and specified. Before selecting the required hardware, consult manufacturer's catalogues for available types, designs and recommended functions. The quantity required for each item should be listed when necessary.

It is recognized that some door manufacturers as well as some hardware manufacturers prefer to have the hardware specified and included under the Hardware Section of the project specifications. In such cases the preparation of doors and frames to receive the hardware specified would remain part of the door work and the hardware would be specified under the Hardware Section of the project specification.

Where items of hardware such as the mechanism for balanced doors, integral push bars, concealed closing

devices and special panic bolts for exceptionally narrow stile doors are designed as an integral part of the door or frame construction, it is necessary to have such items furnished with the doors. Other items of hardware may be specified with the doors or under the Hardware Section of the project specifications as desired.

NOTE 7: The type of stainless steel shoes or fittings at top and bottom of tempered glass doors and sidelights should be listed herein or on drawings. Most fittings are designed to receive ½ inch or ¾ inch thick glass. The glass for this type of door and also adjacent sidelights should be specified herein. Other adjacent glass may be specified herein or under Section "Glass and Glazing."

NOTE 8: The short form of suggested specification for automatic power operators is included for the convenience of those who wish to specify power operators as a part of the door work.

The installation of power operators usually involves the work of several different building trades and may also require special reinforcing of the doors and frames. It is recognized that some door manufacturers and some manufacturers of power operators prefer to have the power operating equipment specified in a separate section of the project specifications. It is also recognized that some door manufacturers are equipped to furnish the doors and frames as a complete unit with all hardware and power operating equipment.

When automatic power operators are specified as part of the door work, the necessary cross references should be made in other sections that may be affected. The amount of electrical or piping work required as well as preparatory work of other trades to receive the operators and equipment should be clarified. Refer to manufacturer's specifications and recommendations for detail requirements.

Before selecting the type of operator or control equipment to be located in hazardous areas such as hospital operating departments, anesthesia rooms or other areas where explosive fumes or gases are present, consult with operator manufacturer. Some manufacturers caution against using their equipment in such areas; other manufacturers recommend the use of explosion proof switches and/or equipment in these areas and in some cases recommend the location of the operating unit outside the hazardous area.

NOTE 9: The problem of protecting and repairing doors after installation is often a major problem for the door manufacturer or subcontractor. In many cases certain doors are erected and placed in operation several months prior to completion of the project. When such conditions occur, a suggested solution is to have an inspection made of the doors by the General Contractor and Architect's field inspector soon after installation. If doors comply with contract requirement, an agreement could then be made for placing the responsibility for correcting any future damage to the doors.

The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the Door Sub-Contract. However, the final cleaning is specified to be included under another section of the project specification. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the Work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" or "Special Conditions" Section of the project specifications. When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish used should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

Issued: October 1963
Revised: January 1966

Stainless Steel Swinging Doors and Frames

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel swinging doors, door frames, adjacent framing, ... and related items necessary to complete the work indicated on drawings and described in specifications.

SEE NOTE 1 (B) ITEMS INCLUDED: In general the work to be performed under this section shall include the following items:

(1) Full glazed type stainless steel stile and rail doors at opening Nos. . . . . .
(2) Flush type stainless steel doors at opening Nos. . . . . .
(3) Flush type stainless steel doors, with (glazed) —(louvered) panels of sizes shown, at opening Nos. . . . . .
(4) Tempered glass doors with stainless steel shoes and fittings at opening Nos. . . . . .
(5) Stainless steel frames for doors at opening Nos. . . . . , and adjacent framing for transoms, sidelights and glass enclosures as indicated.
(6) All hardware for doors at opening Nos. . . . . .
(7) Thresholds, saddles and floor plates for doors at opening Nos. . . . . .
(8) Weatherstripping for exterior doors at opening Nos. . . . . .
(9) Concealed structural steel reinforcing members as indicated or necessary for frames and framing members.
(10) Glass and (metal glazing beads) —(flexible glazing gaskets) for doors, transoms, sidelights and . . . . . .
(11) Automatic power operators and accessories for doors at opening Nos. . . . . .
(12) Metal to metal caulking of frames and framing members.
(13) Installation of all items specified, unless designated otherwise.
(14) Initial cleaning of stainless steel.
( ) . . . . . .

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications.

(1) Glass and glazing, except as specified herein: in Section No. . . . . .
(2) Electric conduit and wiring in connection with automatic door operators: in Section No. . . . . .
(3) Hardware, except as specified herein: in Section No. . . . . .
(4) Master keyed lock cylinders: in Section No. . . . . .
(5) Structural supports at mullions and . . . . . except as specified: in Section No. . . . . .
(6) Caulking except, as specified herein: in Section No. . . . . .
(7) Final cleaning of glass and stainless steel: in Section No. . . . . .
(8) Stainless steel elevator doors and frames: in Section No. . . . . .
(9) Stainless steel revolving doors: in Section No. . . . . .
(10) Stainless steel rolling doors and grilles: in Section No. . . . . .
(11) Preparatory work and . . . . . required for automatic door operators: in Section No. . . . . .
(12) Electric conduit and wiring from main panel to door operators and control equipment for doors equipped with automatic operators: in Section No. . . . . .
( ) . . . . . .

(D) ALTERNATES: Note that alternate No. . . . . affects the work required under this section. Refer to Bid Form and to Section . . . . . for a detailed description of the alternates required.

2. SHOP DRAWINGS:

(A) Submit . . . . . copies of shop drawings for all items specified herein to Architect for approval. Obtain approval of drawings prior to proceeding with manufacturing. Shop drawings shall indicate: elevations of each

door type; details of each frame type; glass thickness required; location in the building for each item; sizes of structural subframes and reinforcing members; methods of assembling, fastening and anchoring; location and installation requirements for hardware; size, shape and thickness of materials; joints and connections with other work; (location of automatic door operators and control equipment)—and .....

3. SAMPLES:

(A) Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements as stated in section No. ..... General Conditions.

(1) Samples approximately 3 by 6 inch size of stainless steel in each finish specified.

(2) Samples (or cuts) of each item of hardware proposed for use.

(3) Corner section sample of door, glazing beads or glazing gaskets.

(4) Manufacturers' specification and installation instructions for automatic door operators.

( ) .....

4. FULL GLAZED STILE AND RAIL DOORS:

SEE NOTE 2

(A) TYPE AND MANUFACTURER: Full glazed stainless steel (swinging)—(balanced) doors at opening No. ..... shall be (custom)—(standard) type, similar to model No. ..... as manufactured by ..... Similar type doors as manufactured by ..... or ..... may be used, provided they comply with requirements indicated and specified.

(1) Doors shall be complete with frames, framing members, (hardware)—(transoms)—(adjoining sidelights)—(adjoining window wall)—(adjoining trim)—(thresholds)—(glazing)—and other accessories as indicated or specified. Doors shall be of sizes and design indicated.

SEE NOTE 3

(B) CONSTRUCTION REQUIREMENTS: Doors, frames, (hardware) and accessories shall be constructed in accordance with the current published specifications of the Door Manufacturer for the type, series or model No. of the item listed, with modifications and other requirements as indicated on project drawings and described in the project specifications. (The requirements indicated on the project drawings or described in the project specifications shall take precedence over any similar requirements described in the above referenced Manufacturer's Specifications.)

(1) Make all necessary provisions in doors and frames to receive the hardware and accessories specified, (except the drilling and tapping required for surface mounted hardware). Where concealed door closers or other operating mechanisms are required in door or frame members, the necessary additional space, cut-outs, reinforcement and provisions for fastening and access shall be provided.

(C) TYPE OF METAL, FINISH AND FASTENINGS: All exposed metal for doors, frames, framing members and ..... shall be mechanically leveled stainless steel, conforming to ASTM Specification A 167-63, Type 302, Type 304 or Type .... All bolts, screws and fastenings in finished work shall be stainless steel, of type recommended by the Manufacturer and of color and finish to match the adjacent stainless steel surface.

(1) Exposed surfaces of stainless steel shall have (a No. 4 finish)—(a ..... finish) to match approved sample. Stainless steel for concealed reinforcing and other unexposed surfaces shall not require any special finish.

(D) GAUGES OF METAL: The metal thickness for stainless steel (and carbon steel) shall be of the following minimum U. S. Standard gauges:

SEE NOTE 3

(1) Face sheets for doors: .... gauge stainless steel.

(2) Internal door reinforcement: (18)—( ) gauge (stainless steel)—(galvanized carbon steel).

(3) Hinge and lock reinforcement: (3/16 inch)—(..... gauge)—(stainless steel)—(galvanized carbon steel).

(4) Reinforcement for surface applied hardware: (12)—(.....) gauge (stainless steel)—(galvanized steel).

(5) Door frames, heads and jamb: (16)—(18) gauge stainless steel.

(6) Mullions, transom bars and .....: (16)—(18) gauge stainless steel.

(7) Glazing beads: .....gauge stainless steel.

(8) Trim: 18 gauge to 8 inch width; 16 gauge to 12 inch width; 14 gauge over 12 inch width; stainless steel, except as noted.

(9) .....: ..... gauge .....

(E) WORKMANSHIP: The finished work shall be rigid, neat in appearance and free from defects. Shapes shall be accurately formed to required sizes and profiles with joints carefully fitted tight and welded or secured mechanically to form a tight joint. Welding and dressing shall be done in a manner that will not leave blemishes on exposed surfaces. Welded joints on exposed surfaces shall be dressed smooth and have same color and finish as the adjacent stainless steel. Exposed screws or bolts will be permitted only at inconspicuous locations, and shall have heads countersunk.

(F) DOOR FRAMES AND FRAMING: Stainless steel frames for doors and adjacent framing for (transoms)—(sidelights)—(window walls) and ..... shall be of formed welded or tubular construction. Provide frames with anchors of type and spacing (as indicated on project drawings)—(as indicated on approved shop drawings). All steel sub-frames, core members, anchors, internal or concealed structural reinforcing of (carbon steel)—(galvanized steel)—(stainless steel) back of or inside the frames and at mullions, transom bars and

. . . ., shall be provided with the frames or the framing members. The sizes, shapes and methods of anchoring to adjacent work shall be as indicated on project drawings and as detailed on approved shop drawings. Joints between reinforcing members shall be welded, except where other type of joints are indicated or approved. Sub-frames and structural reinforcing members of carbon or galvanized steel shall be primed with zinc chromate or other approved paint.

(1) Where (indicated on drawings) — (required for stability), the reinforcing at vertical mullions shall extend up to the overhead structural slab or framing and be secured thereto. (Free standing door frames shall be heavily reinforced and securely anchored to floor construction as indicated on approved shop drawings and in accordance with recommended methods of the manufacturer.)

(G) GLAZING BEADS: Provide removable stainless steel glazing beads for securing glass in (doors) — (in adjacent frames and . . . .). Removable beads will not be required for doors that are constructed without the use of beads. Beads shall be (of type for use with glazing tapes and compounds and secured with screws) —(snap-on type with neoprene, butyl rubber, or vinyl gaskets). Beads shall be carefully fitted and joined at corners, and be of adequate size and spacings to receive the type and thickness of glass indicated. Beads or stops on the outside face of exterior doors and . . . . shall be non-removable type and without exposed screws.

SEE NOTE 4 (H) GLASS: Glass in connection with . . . . type doors at opening Nos. . . . . . . and adjacent fixed glass for (transoms) — (sidelights) and . . . . shall be provided with the doors and be of types and thickness hereinafter listed. (Where glass in doors or adjacent frames have edges exposed without frames, the exposed edges shall be ground and polished.)

(1) DOORS: (Polished plate) — (Tempered plate) — (Tinted polished plate) — (Tinted tempered plate) — (Obscure patterned) — (. . . . .), (¼)—(⅜)—(½)—(. . . . . .) inch thick.

(2) TRANSOM AND SIDELIGHTS: (Polished plate) — (Tempered plate) — (Tinted polished plate) — (Tinted tempered plate) — (Obscure patterned) — (. . . . .), (¼) — (⅜) — (½) — (. . .) inch thick.

(I) GLAZING: Glass specified to be furnished and installed under this section for (doors) — (transoms) — (sidelights) and . . . . shall be installed under the direction of the Door Manufacturer. The method of installing glass and the type of (glazing compounds) — (glazing gaskets) and glazing beads to be used shall be (as specified for exterior metal doors under the "Glass and Glazing" section of the specifications) — (as described in the Door Manufacturer's Specifications). The entire installation shall be watertight.

(J) HARDWARE: The finish of exposed metal surfaces of hardware shall match the finish on doors as closely as possible; however, some allowance will be made when different types of metals or finishes are used. Doors shall be provided with hardware as follows: SEE NOTE 5

(1) Exterior Doors at Opening Nos. . . . . :

. . . .　　. . . . .
. . . .　　. . . . .
. . . .　　. . . . .

(2) Vestibule Doors at Opening Nos. . . . . :

. . . .　　. . . . .
. . . .　　. . . . .
. . . .　　. . . . .

(3) Interior Doors at Opening Nos. . . . . :

. . . .　　. . . . .
. . . .　　. . . . .
. . . .　　. . . . .

(K) ACCESSORIES: The following items and accessories shall be provided with the doors at openings indicated.

(1) THRESHOLDS: Provide thresholds under doors at opening Nos. . . . . .; (extend thresholds under adjacent sidelights). Construct thresholds of (cast nickel bronze with abrasive surface) — (cast aluminum with abrasive surface) — (formed stainless steel) — (extruded aluminum). Thresholds shall be . . inch high and (. . . inches wide) — (of widths indicated). Provide holes to receive countersunk expansion bolts or screws. (Formed stainless steel thresholds shall have reinforcing on bottom side.)

(2) WEATHERSTRIPPING FOR EXTERIOR DOORS: Exterior doors at opening Nos. . . . shall be provided with manufacturer's standard type of weatherstripping at top, bottom, and on all edges. Where finger guards occur at pivoted stiles, adjust weatherstripping to fit conditions. (Weatherstripping at lock stile edges of pairs of double-acting doors shall be adjustable.) All weatherstripping shall be designed for easy removal and replacement.

(3) ASTRAGALS: Pairs of single acting doors at opening Nos. . . . shall have stainless steel astragals of design and thickness standard with the door manufacturer. When both doors are made active, a split type astragal shall be used. Doors at opening Nos. . . . shall have overlapping type astragal applied to active leaf.

(4) FINGER GUARDS: Finger guards of manufacturer's standard design shall be provided on pivoted stile edge of doors at opening Nos. . . . . . .

(5) MAIL SLOT: Provide one mail slot with cover in (bottom rail) — (center rail) — (under center rail) of door at opening Nos. . . . (in bottom rail or sidelight adjacent to door at opening Nos. . . . . .).

(6) BUMPER RAIL: Provide stainless steel bumper rail on (one side) (each side) of doors at opening Nos. . . . . Rail shall be . . . . . inches wide, and not less than (3/8 inch)—(. . . . . inch) thick; extend rail horizontally across door and locate with top approximately . . . . . inches above floor.

(7) ELECTRIC STRIKE: Provide electric strike for remote control use at door Nos. . . . . Strikes shall be of type standard with the Door Manufacturer. Make the necessary revisions in other hardware as required and provide the necessary mortising and reinforcing of door and frame. (Electric wiring for the strike is included under the Electrical Section of the project specifications.)

(8) Automatic Power Operators: Doors at opening Nos. . . . . shall be equipped with automatic power operators (of type hereinafter specified) —(of type specified in Section No. . . . .). Make all necessary provisions and adjustments in doors and frames to receive the automatic power operators specified.

5. FLUSH DOORS:

SEE NOTE 2 (A) TYPE AND MANUFACTURER: Flush stainless steel (swinging)—(balanced) doors at opening Nos. . . . . shall be (custom)—(standard) type, similar to model No. . . . . as manufactured by . . . . . Similar type doors as manufactured by . . . . . or . . . . . may be used, provided they comply with requirements indicated and specified.

(1) Doors shall be complete with frames, framing members, (hardware)—(transoms)—(adjoining sidelights)—(adjoining window wall)—(adjoining trim)—(thresholds)—(weatherstripping) and other accessories as indicated or specified. Doors shall be of size and design indicated.

SEE NOTE 3 (B) CONSTRUCTION REQUIREMENTS: Doors, frames, (hardware) and accessories shall be constructed in accordance with the current published specifications of the Door Manufacturer for the type, series, or model No. of the item listed, with modifications and other requirements as indicated on the project drawings and described in the project specifications. (The requirements indicated on the project drawings or described in the project specifications shall take precedence over any similar requirements described in the above referenced Manufacturer's Specifications.)

(1) Make provisions in doors and frames to receive the hardware and accessories specified, (except the drilling and tapping required for surface mounted hardware). Where concealed door closers or other operating mechanisms are required in door or frame members, the necessary additional space, cutouts, reinforcement and provision for fastening and access shall be provided.

(C) TYPE OF METAL, FINISH AND FASTENERS: All exposed metal for doors, frames, framing members and . . . . . shall be mechanically leveled stainless steel, conforming to ASTM Specifications A 167-63, Type 302, Type 304 or Type . . . . . All bolts, screws and fastenings in finished work shall be stainless steel, of type recommended by the Manufacturer and of color and finish to match the adjacent stainless steel surface.

(1) Exposed surfaces of stainless steel doors at opening Nos. . . . . shall have (a No. 4 smooth satin finish)—(a striated or ribbed finish)—(a . . . . . finish). Stainless steel for concealed reinforcing and other unexposed surfaces shall not require any special finish.

(D) GAUGES OF METAL: The metal thickness for stainless steel (and carbon steel) shall be of the following minimum U.S. Standard gauges: SEE NOTE 3

(1) Face sheets for doors: . . . . . gauge stainless steel.

(2) Internal stiffeners, when used: (18)—( ) gauge (stainless steel)—(galvanized carbon steel).

(3) Hinge and lock reinforcement: (3/16 inch)—(. . . . . gauge)—(stainless steel)—(galvanized carbon steel).

(4) Reinforcement for surface applied hardware: (12)—(. . .) gauge (stainless steel)—(galvanized steel).

(5) Door frames, heads and jambs: (16)—(18) gauge stainless steel.

(6) Mullions, transom bars and . . . . . : (16)—(18) gauge stainless steel.

(7) Glazing beads: . . . . . gauge stainless steel.

(8) Trim: 18 gauge to 8 inch width; 16 gauge to 12 inch width; 14 gauge over 12 inch width; stainless steel, except as noted.

(9) . . . . . : . . . gauge . . . . . .

(E) WORKMANSHIP: The finished work shall be rigid, neat in appearance and free from defects. Form shapes to required sizes and profiles with joints carefully fitted in accordance with manufacturer's standards. When joints are welded, perform welding and dressing in such manner that the finished joints are invisible and have the same color and finish as adjacent surfaces. Faces of doors shall be flat and free of warps or buckles. SEE NOTE 5

(F) DOOR FRAMES AND FRAMING: Stainless steel frames for doors and adjacent framing for (transoms)—(sidelights)—(window walls) and . . . . . shall be of formed welded, or tubular construction. Provide frames with anchors of type and spacing (as indicated on project drawing)—(as indicated on approved shop drawings). All steel sub-frames, core members, anchors, internal or concealed structural reinforcing of

(carbon steel)—(stainless steel) back of or inside the frames and at mullions, transom bars and ...., shall be provided with the frames or the framing members. The sizes, shapes, and methods of anchoring to adjacent work shall be as indicated on project drawings and as detailed on approved shop drawings. Joints between reinforcing members shall be welded, except where other type of joints are indicated or approved. Sub-frames and structural reinforcing members of carbon or galvanized steel shall be primed with zinc chromate or other approved paint.

(G) GLAZING BEADS: Provide removable stainless steel glazing beads for securing glass (in doors)—(in adjacent frames). Beads shall be (of type for use with glazing tapes and compounds and secured with screws)—(snap-on type with neoprene, butyl rubber, or vinyl gaskets). Beads shall be carefully fitted and joined at corners and be of adequate size and spacings to receive the type and thickness of glass indicated. Beads or stops on the outside face of exterior doors and .... shall be non-removable type and without exposed screws.

SEE NOTE 6 (H) HARDWARE: The finish of exposed metal surfaces of hardware shall match the finish on doors as closely as possible; however, some allowance will be made when different types of metals or finishes are used. Doors shall be provided with hardware as follows:

(1) Exterior Doors at Opening Nos. ....:

....
....
....

(2) Vestibule Doors at Opening Nos. ....:

....
....
....

(3) Interior Doors at Opening Nos. ....:

....
....
....

(I) ACCESSORIES: The following items and accessories shall be provided with the doors at openings indicated:

(1) THRESHOLDS: Provide thresholds under doors at opening Nos. ....; (extend thresholds under adjacent sidelights). Construct thresholds of (cast nickel bronze with abrasive surface)—(cast aluminum with abrasive surface)—(formed stainless steel)—(extruded aluminum). Thresholds shall be .... inch high and (....... inches wide)—(of widths indicated). Provide holes to receive countersunk expansion bolts or screws. (Formed stainless steel thresholds shall have reinforcing on bottom side.)

(2) WEATHERSTRIPPING FOR EXTERIOR DOORS: Exterior doors at opening Nos. .... shall be provided with Manufacturer's standard type of weatherstripping at top, bottom, and on all edges. Where finger guards occur at pivoted stiles, adjust weatherstripping to fit conditions. (Weatherstripping at lock stile edges of pairs of double-acting doors shall be adjustable.) All weatherstripping shall be designed for easy removal and replacement.

(3) ASTRAGALS: Pairs of single acting doors at opening Nos. .... shall have stainless steel astragals of design and thickness standard with the door manufacturer. When both doors are made active, a split type astragal shall be used. Doors at opening Nos. .... shall have overlapping type astragal applied to active leaf.

(4) AUTOMATIC POWER OPERATORS: Doors at opening Nos. .... shall be equipped with automatic power operators (of type hereinafter specified)—(of type specified in Section ....). Make all necessary provisions and adjustments in doors and frames to receive the automatic power operators specified.

6. TEMPERED GLASS DOORS:

(A) TYPE AND MANUFACTURER: Tempered glass (swinging)—(balanced) doors with stainless steel shoes and fittings, trim and frames at opening Nos. .... shall be "....................." doors as manufactured by .... (Similar type doors as manufactured by ...., may be used, provided they comply with requirements indicated and specified.) SEE NOTE 2

(1) Doors shall be complete with glass, (hardware)—(frames)—(framing members)—(transoms)—(adjoining sidelights)—(adjoining window wall)—(adjoining trim), thresholds and other accessories as indicated or specified.

(B) CONSTRUCTION REQUIREMENTS: Doors, frames, (hardware) and accessories, shall be constructed in accordance with the current published specifications of the Door Manufacturer for the type or model No. of the item listed, with modifications and other requirements as indicated on the project drawings and described in the project specifications. (The requirements indicated on the project drawings or described in the project specifications shall take precedence over any similar requirements described in the above referenced Manufacturer's Specifications.) SEE NOTE 3

(1) Tempered glass doors (and sidelights) shall be construction of (¾ inch)—(⅝ inch)—(½ inch) thick (tempered polished plate)—(tinted tempered polished plate)—(tempered rough plate)—(tempered rough texture obscure pattern) glass. Glass for transoms and .... shall be .... glass, ... inch thick. All exposed edges of glass doors and sidelights shall be ground to proper radius and polished smooth.

SEE NOTE 7

(2) Glass for doors (and sidelights) shall have stainless steel shoes and fittings at top and bottom as follows:

Bottom of Door: (Continuous fitting No. . . . .)—(Corner unit fitting No. . . . .).

Top of Door: (Continuous fitting No. . . . .)—(Corner unit fitting No. . . . .).

Bottom of Sidelights: (Continuous sidelight track fitting No. . . . .)—(Continuous stop moulding).

Top of Sidelight: (Continuous sidelight track fitting No. . . . .)—(Continuous stop moulding).

(3) Make all necessary provisions in doors and frames to receive the hardware and accessories specified. Where concealed door closers or other operating mechanism is required in door or frame members, the necessary additional space, cutouts, reinforcement and provision for fastening and access shall be provided.

(C) TYPE OF METAL, FINISH AND FASTENINGS: All exposed metal for glass door fittings, frames, framing members and . . . . . shall be mechanically leveled stainless steel, conforming to ASTM Specification A 167-63, Type 302, Type 304 or Type . . . . . All bolts, screws and fastenings in finished work shall be stainless steel, of type recommended by the Manufacturer and of color and finish to match the adjacent stainless steel surface.

(1) Exposed surfaces of stainless steel used for tempered glass door shoes and fittings, (hardware), frames and . . . . . shall have (a No. 4 smooth satin finish)—(a . . . . . finish) to match approved sample.

SEE NOTE 3

(D) GAUGES OF METAL: The metal thickness for stainless steel shall be of the following minimum U.S. Standard gauges:

(1) Door and sidelight shoes and fittings: When applied over aluminum core, 20 gauge; when formed stainless steel shapes are used, 16 gauge with additional carbon steel reinforcement.

(2) Door frames, heads and jambs: (18)—(16)—(. . .) gauge.

(3) Mullions, transom bars and . . . . . : (16)—(18) gauge.

(4) Glazing beads: (18)—(20) gauge.

(5) Trim: 18 gauge to 8 inch width; 16 gauge to 12 inch width; 14 gauge for over 12 inch width.

(6) . . . . . : . . . . . gauge.

(E) DOOR FRAMES AND FRAMING: Stainless steel frames for tempered glass doors and adjacent framing for (transom)—(sidelights)—(window walls) and . . . . . shall be of formed welded, or tubular construction. Provide frames with anchors of type and spacing (as indicated on project drawings)—(as indicated on approved shop drawings). All steel sub-frames, core members, anchors, internal or concealed structural reinforcing of (carbon steel)—(galvanized steel)—(stainless steel) back of or inside the frames and at mullions, transom bars and . . . . . , shall be provided with the frames or the framing members. The sizes, shapes and methods of anchoring to adjacent work shall be as indicated on project drawings and as detailed on approved shop drawings. Joints between reinforcing members shall be welded, except where other type of joints are indicated or approved. Sub-frames and structural reinforcing members of carbon or galvanized steel shall be primed with zinc chromate or other approved paint.

(1) REINFORCING: Where (indicated on drawings)—(required for stability), the reinforcing at vertical mullions shall extend up to the overhead structural slab or framing and be secured thereto. (Free standing door frames shall be heavily reinforced and securely anchored to floor construction as indicated on approved shop drawings.)

(2) WORKMANSHIP: The finished work shall be rigid, neat in appearance and free from defects. Form shapes to required sizes and profiles with joints carefully fitted tight and welded, or secured mechanically to form an approved watertight joint. Perform welding and dressing in such manner that the finished joints are invisible and have the same color and finish as adjacent surfaces. Exposed screws and bolts will be permitted only at inconspicuous locations, and shall have heads countersunk.

(3) GLAZING BEADS: Provide removable stainless steel glazing beads for securing glass in (transom)—(sidelights)—(and adjacent frames). Beads shall be (of type for use with glazing tapes and compounds and secured with screws)—(snap-on type with neoprene, butyl rubber or vinyl gaskets). Beads shall be carefully fitted and joined at corners and be of adequate size and spacings to receive the type and thickness of glass indicated. Beads or stops on the outside face of glass in exterior frames shall be non-removable type and without exposed screws.

(4) GLAZING: The installation of glass specified to be furnished and installed under this section for (sidelights)—(transoms)—(and adjacent stainless steel frames) shall be the responsibility of the Door Manufacturer. The method of installing glass and the type of glazing compounds or glazing gaskets to be used shall be (as described in the Door Manufacturer's specifications)—(as specified for exterior fixed metal frames under the "Glass and Glazing" Section of the project specifications). The entire installation shall be watertight.

SEE NOTE 6 (F) HARDWARE: The finish of exposed metal surfaces of hardware shall match the finish on the door fittings as closely as possible; however, some allowance will be made when different types of metals or finishes are used. Doors shall be provided with hardware as follows:

(1) Exterior Doors at Opening Nos. ....:

....
....
....

(2) Vestibule Doors at Opening Nos. ....:

....
....
....

(3) Interior Doors at Opening Nos. ....:

....
....
....

(G) ACCESSORIES: The following items and accessories shall be provided with the doors at openings indicated:

(1) THRESHOLD: Provide thresholds under doors at opening Nos. ...... (extend thresholds under adjacent sidelights). Construct thresholds of (cast nickel bronze with abrasive surface)—(cast aluminum with abrasive surface)—(formed stainless steel)—(extruded aluminum). Thresholds shall be .... inch high and (.... inches wide)—(of widths indicated). Provide holes to receive countersunk expansion bolts or screws. (Formed stainless steel thresholds shall have reinforcing on bottom side.)

(2) MAIL SLOT: Provide a vertical mail slot (without cover plate)—(with cover plate) in (tempered glass door)—(tempered glass sidelight) at opening No. .... Locate slot approximately 30 inches above floor and space horizontally as indicated or directed.

(3) DECORATIVE DESIGN: Tempered glass doors at opening no. .... shall have decorative (sandblast design)—(fused ceramic color design)—(applied wood or metal designs) as indicated on details.

(4) AUTOMATIC POWER OPERATORS: Doors at opening Nos. .... shall be equipped with automatic power operators (of type hereinafter specified)—(of type specified in Section ....). Make all necessary provisions and adjustments in doors and frames to receive the automatic power operators specified.

(5) ELECTRIC STRIKE: Provide electric strike for remote control use for doors at opening Nos. .... Strikes shall be of type standard with the Door Manufacturer. Make the necessary revisions in other hardware as required. (Electric wiring and controls is included in the Electrical Section of the project specifications.)

7. AUTOMATIC POWER OPERATORS:

(A) LOCATION, TYPE AND MANUFACTURER: Automatic power operators shall be provided for doors (at opening Nos. ......)—(at openings hereinbefore specified). Operators shall be "................" as manufactured by .... The operators and all controls and accessories shall be constructed and installed in accordance with the current published specifications of the Manufacturer with modifications and other requirements indicated or specified for the project. SEE NOTE 8

(B) OPERATING MECHANISM AND CONTROLS: The operating mechanism shall be (electric)—(hydraulic)—(electric-hydraulic)—(air)—(............) and shall be located in .... The doors shall be controlled by means of (recessed or surface mounted floor mats of sizes indicated)—(photo-electric controls located as indicated)—(door handles with low voltage wiring and switch)—(pull cord)—(foot or hand operated wall switch)—(explosion proof wall switch)—(................).

(C) ACCESSORIES AND SPECIAL ITEMS: In addition to the operating mechanism, controls, wiring, piping, hardware and other standard equipment normally furnished, the following special items and accessories shall be provided for each door having automatic operation: (Note: Select and list only the applicable items).

(1) All traffic guide or guard railings.
(2) Barrier ropes.
(3) Finger guards on hinge stile.
(4) Photoelectric fittings and posts.
(5) Panic release.
(6) Safety mat.
(7) Adjustable controls for opening and closing speeds.
(8) Easily removable unit for replacement or service.
(9) Easily converted to manual operation if power fails.
(10) Positive hold-open device.
(11) Cylinder lock with cylinder keyed to ....
( ) ....

8. INSTALLATION OF DOORS, FRAMES AND ACCESSORIES:

(A) Doors, frames, framing members, hardware, (glass)—(automatic power operators) and accessories shall be installed and adjusted by experienced and qualified mechanics. Installation shall be in accordance with details on drawings, manufacturer's directions and approved shop drawings. The finished work shall be rigid, neat in appearance and free from defects. Upon completion, doors shall be lubricated and adjusted to operate properly.

9. PROTECTION AND CLEANING:

(A) PROTECTION: Protect doors, frames and acces- SEE NOTE 9

sories from damage of any kind during handling, transportation and at the job site. Remove any protective tape coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect doors and frames from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance. Replace any broken glass.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel doors and frames shall have all smears of compounds, tapes and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturers of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel surfaces is included in another section of the project specification and is not a part of the door contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish Owner with complete maintenance instructions for adjusting mechanism of doors (and hardware)—(and automatic power operators) and power operators and for cleaning and maintaining exposed metal surfaces.

Suggested Guide Specifications for

Stainless Steel Rolling Doors and Grilles

Notes for Specification Writer

GENERAL NOTES:

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System are used for numbering the project specifications, the Stainless Steel Rolling Doors and Grilles Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Door, Windows and Glass" and be numbered accordingly.

It may be necessary at times to combine certain items of these Suggested Guide Specifications under another trade section of the project specification, or to include other items in this Section. Before combining Rolling Doors and Grilles with other work, consider the manner in which sub-bids may be submitted and also the responsibility for installation of the combined work.

On projects where stainless steel column covers, jambs, head and trim occur adjacent to rolling doors, grilles or shutters and they are to be included in other sections, the necessary coordination and cross references should be provided and the responsibility for matching finishes should be clearly defined.

These Suggested Guide Specifications are prepared on the basis that the Stainless Steel Rolling Door and Grille work will be a subcontract under a General Contractor, and all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the necessary revisions should be made.

When the door, grille or shutter manufacturer's specification is made the basis for construction requirements by reference in the project specifications, all modifications, exceptions and optional features should be specified; the correct model or type number of the item and the title and date of the catalogue or specification should be listed. In addition, a copy of the Referenced Manufacturer's Specification should be made available to bidders during the bidding period, and a copy should be available at the project site during the construction period.

Most manufacturers can furnish a hinged pass door to be built within the rolling door; this arrangement should be avoided if possible, and pass doors, when required, located in building wall near the rolling door.

When rolling grilles are used in corridors, the guides are often recessed into the walls; if this is required, suitable wood or metal grounds should be provided under the Carpentry Section to receive the guides. Where suspended ceilings occur in corridors having rolling grilles, it is possible to mount the brackets, shaft and hoods above the ceiling; in such cases, the necessary supports and access panels should be provided.

Rolling doors and grilles to suit special conditions can be furnished by most manufacturers as optional equipment. Some of the optional equipment consists of removable or stationary intermediate mullions to reduce the size of large openings; a combination grille and rolling door installed in the same opening; special weatherstripping of doors; fixed grilles in various size panels to match the rolling grilles.

NOTES FOR SPECIFIC ITEMS:

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade. Such a list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings and schedules clearly indicate the extent and location of all items to be in-

cluded under this section, the entire paragraph could be omitted.

NOTE 2: Paragraph 4 covers the type and finish of metals to be used generally for doors, grilles and shutters. When other metals and finishes are required for a specific item, they should be specified as a part of that item.

Finish No. 2 B is generally considered adequate for slats and bars of rolling service doors and grilles where appearance and constant cleaning are not a major factor. In addition, the abrasive action caused by one grille or slat unit rubbing upon another will tend to discourage the use of a highly polished finish.

Where appearance is an important factor, and some maintenance is anticipated, a No. 4 finish is recommended for rolling grilles and shutters and for stainless steel frames, sills, trim, hoods and fascias in connection with this work.

Certain parts of rolling doors and grilles such as shafts, barrels, springs, brackets, gears, chains, anchors, etc., are usually made of carbon steel, malleable iron or cast iron as required. Where the steel or iron item will be exposed and affect the appearance of the adjacent stainless steel door or grille, they may be covered with a light gauge stainless steel or given other suitable finish such as a dull chrome; specify the finish desired.

NOTE 3: Where sustained wind pressures greater than 20 pounds per square foot are anticipated, the specification for exterior doors should be changed to strengthen the doors in accordance with manufacturer's recommendations and local conditions.

NOTE 4: Where maximum weather protection is required for exterior doors, the requirements for endlocks, windlocks, slats, guides and other items as necessary should be revised to provide the desired protection. The spacing of windlocks is determined by the designed wind pressure specified, the door width and the gauge of metal slats used. Refer to manufacturer's literature for details and recommendations.

NOTE 5: It is intended that the name of shutter manufacturer, model or series number of unit and all specialty items and accessories be included in this paragraph. When listing acceptable or optional manufacturers, check and verify that the manufacturers listed can produce the items as specified. In addition, the manufacturers listed should produce shutters of comparable quality and in similar price ranges.

Stainless steel rolling shutters are available from most rolling door manufacturers as a factory assembled package unit with integral frames, sills and other trim. Most units of this type are used at pass windows, for installations over counters or other small openings. Separate shutter units without frames and trim are also available from some manufacturers. Refer to manufacturer's literature for details and optional features.

NOTE 6: It is intended that the name of grille manufacturer, model or series number of unit and all specialty items and accessories be included in this paragraph. Refer to manufacturer's catalogues for special and optional features. When listing acceptable or optional manufacturers, check and verify that the manufacturers listed can produce the items specified. In addition, the manufacturers listed should produce grilles of comparable quality and in similar price ranges.

Where fixed stainless steel grilles of design to match the rolling grilles are required, revise the specifications accordingly.

NOTE 7: Check and specify the correct current characteristics for power operator motors to suit project requirements. Check local job conditions for requirement of transformer; modify specifications as required. Check and coordinate the electrical work as described herein with the electrical specifications for the project.

Where electric operators are installed in hazardous locations, consider the use of explosive proof equipment for motors, operators and control equipment. In some cases, parts of operating equipment may be located out of the hazardous zone.

Where dual control switches are necessary for the same door operator, the second switch control station should be located so the operator will have complete visibility of the door at all times.

The control switches specified are 3-button type for Open-Close-Stop. Where 2-button constant pressure type control switches for Open-Close are required, revise the paragraph on switches accordingly.

When power operators are specified for over counter or other small size rolling shutters, some manufacturers have recommended changes to the Electric Power Operator Specifications herein. Because of the light weight and/or infrequent operation of such shutters, smaller 3 phase motors or single phase reversible motors are often used, and some of the mechanical and electrical control equipment specified may not be necessary. Obtain Shutter Manufacturer's recommendations and consider the following changes, most of which will result in a savings to the Owner.

(1) Use a slipping (friction) clutch on the motor unit.
(2) Use a three position constant pressure selector switch marked "OPEN-OFF-CLOSE" with spring return to OFF position.
(3) Provide emergency manual operation by easing of the friction clutch.
(4) Omit limit switch when friction clutch is used and constant pressure selector switch is located within sight of shutter.
(5) When friction clutch is used, the safety device specified on bottom of shutter may be omitted.

NOTE 8: The problem of protecting or repairing rolling doors after installation is often a major problem for the door manufacturer or subcontractor. In many cases rolling doors are erected and placed in operation several months prior to completion of the project. Unless the doors are locked in the open position they are likely to become damaged by other trades after installation. Locking doors in the open position may also present difficulties due to weather conditions. When such conditions occur, a suggested solution is to have an inspection made of the doors by the General Contractor and Architect's field inspector soon after installation. If doors comply with contract requirements, an agreement could then be made for placing the responsibility for correcting any future damage to the doors.

The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the Rolling Door and Grille Sub-Contract. However, the final cleaning is specified to be included under another section of the project specifications. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" sections of the project specifications.

When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish used should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

Issued: October 1963
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Stainless Steel Rolling Doors and Grilles

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing stainless steel (rolling service doors) — (rolling shutters) — (rolling grilles)—(power operators), ... and related items necessary to complete the work indicated and specified.

SEE NOTE 1

(B) ITEMS INCLUDED: In general the work to be performed under this section shall include the following items:

(1) Stainless steel rolling service doors at opening Nos. ....., complete with accessories specified.

(2) Stainless steel rolling shutters at opening Nos. ....., over counters, at pass windows, and ....., complete with (frames) — (sills) — (counter top) and accessories specified.

(3) Stainless steel rolling grilles at opening Nos. ....., complete with accessories specified.

(4) Electric power operators for (service door) — (shutters)—(grilles) at opening Nos. ....., complete with motor, controls, and accessories specified.

(5) Installation of all items specified, unless designated otherwise.

(6) Initial cleaning of stainless steel.

( ) .....

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications:

(1) Electric conduit and wiring from main panel to door control equipment, motors and disconnect switches, limit switch, interlock and brake for (doors) — (shutters) — (grilles) that are power operated: in Section Electrical Work.

(2) Access panels for recessed or enclosed hoods: in Section No. .....

(3) Master keyed lock cylinders and padlocks: in Section Hardware.

(4) Structural steel or ..... lintels at head of openings: in Section No. .....

(5) Stainless steel facing and trim for (jambs)—(head) and ..... at opening Nos. ....

(6) Final cleaning.

( ) .....

(D) ALTERNATES: Note that alternate No. ..... affects the work required under this section. Refer to Bid Form and to Section No. ..... for a detailed description of the alternates required.

2. SHOP DRAWINGS:

(A) Submit ..... copies of shop drawings for doors and accessories to Architect for approval. Submit drawings in accordance with requirements described in Section No. ..... General Conditions. Obtain approval of drawings prior to proceeding with manufacturing. Shop drawings shall indicate elevations of each door, grille or shutter; details of jambs and head; construction and clearance required; location of motors, switches, controls and guides; complete wiring diagram for electric power operated doors; method of anchoring and .....

3. SAMPLES:

(A) Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements as stated in Section No. ..... General Conditions.

(1) Samples approximately 3 by 6 inch size of stainless steel in each finish specified and a sample of curtain slat 6 inches long.

(2) Samples of proposed finishes on other metals used.

(3) Manufacturers specification, installation and maintenance instructions for motor operated (doors)—(grilles)—(shutters).

( ) .....

4. METAL AND FINISH:

SEE NOTE 2

(A) The kinds and type of metals and the finishes required under this section shall conform to the following general requirements; however, the metal and finishes hereinafter specified for specific items or locations shall govern.

(1) Except where certain parts or accessories are specified to be constructed of steel, cast iron, aluminum or other metals, the (door curtain)—(grille curtain)—(shutter curtain)—(hoods) and

. . . . . shall be constructed of stainless steel conforming to ASTM Specification A-167-63, Type 302 or Type 304 and of sizes, gauges, shapes and finish as specified. Exposed surfaces of stainless steel used for . . . . . shall have a No. 4 satin-finish to match approved samples. Exposed surfaces of all other stainless steel shall have a (No. 2B mill finish)—(No. . . . . finish). Stainless steel for bars, bolts, screws and fastenings shall be of type recommended by the manufacturer and of color and finish to match the adjacent surfaces.

(2) Steel, cast iron and malleable iron surfaces used in connection with doors, grilles and accessories shall be given the manufacturer's standard shop coat of paint unless other types of finish, or coverings, are specified.

(3) Surfaces of extruded aluminum shapes used for guides and . . .shall have a (natural mill finish) —(caustic etched finish and be anodized).

5. STAINLESS STEEL ROLLING SERVICE DOORS:

(A) TYPE AND OPERATION: Rolling service doors at openings specified shall be overhead coiling type, of sizes indicated, complete with necessary guides, hoods, hardware, fastenings, mechanisms and accessories as indicated and specified.

(1) Rolling doors for opening Nos. . . . . shall be similar to model No. . . . . as manufactured by . . . . . ; provide manual operation by means of (lifting handles and counter-balanced spring)—(chain-gear operator)—(crank-gear operator).

(2) Rolling doors for opening Nos. . . . . shall be similar to model No. . . . . as manufactured by . . . . . and be electric-power operated with auxiliary (chain-gear)—(crank-gear) operation.

(3) Similar type doors as manufactured by . . . . . or . . . . . may be used, provided they comply with requirements indicated and specified.

(B) MOUNTING: Doors shall be (mounted on face of wall)—(mounted between jambs with square hood concealed above head of opening and have removable soffit)—(mounted between jambs with square hood exposed below head of opening and have a removable panel) as indicated.

SEE NOTE 3

(C) CURTAINS: Curtains shall be formed of interlocking stainless steel slats of gauge specified and of shapes standard with the manufacturer. Curtains shall be designed to resist a wind pressure of (20)—(. . . . .) pounds per square foot. Curtain shall roll up on a drum suported at head of opening and be balanced by helical springs. Slats shall be not lighter than the following U.S. standard gauges:

Doors less than 12 feet wide: 24 gauge.

Doors 12 feet wide and less than 18 feet wide: 22 gauge.

Doors 18 feet wide and less than 26 feet wide: 20 gauge.

Doors 26 feet wide and over: 18 gauge.

SEE NOTE 4

(1) Endlocks and Windlocks: The ends of each alternate slat shall have malleable iron end locks. In addition to end locks, exterior doors having a width greater than (14)—(20) feet shall have wind locks at ends of (each sixth slat)—(each alternate slat)—(each slat).

(2) Bottom Rail: Provide a stainless steel bottom bar consisting of (a single angle)—(two equal weight angles)—(of proper size to suit sill construction)—(of sizes indicated on drawings); fasten angles to bottom of curtain. In addition, exterior doors shall have a replaceable weather seal of neoprene or . . .attached to bottom rail.

(3) Vision Panels: Vision panels of type standard with the manufacturer shall be provided in doors where so indicated on drawings.

(D) GUIDES: Guides shall consist of (stainless steel shapes)—(carbon steel shapes with a cadmium plated finish)—(carbon steel shapes with a zinc coated finish) —(carbon steel shapes with a baked enamel finish)—(extruded aluminum shapes) not less than . . . . . inch thick and placed to form a channel pocket of sufficient depth to retain the curtain in place under the wind pressure specified. Attach guides to adjacent construction with . . . . . inch diameter bolts, spaced near each end, and not over . . . . . inches apart.

(E) ROLLER SHAFT: Construct roller shaft from steel pipe, or welded steel tubing, of proper diameter and thickness for the size of curtain. Deflection shall not exceed 0.03 inch per foot of span. Close the ends of roller with cast iron plugs machined to fit the pipe and either pinned, or attached with screws to the spring barrel; do not weld. Oil-tempered, helical, counter-balancing steel springs capable of producing sufficient torque to assure easy operation of the door curtain from any position shall be installed within the roller. Make provisions for spring tension adjustment from outside of bracket and without removing the hood, (except that manual push-up doors and doors mounted between jambs, may have spring adjusting device inside hood). Tension adjustments shall be easily made without the use of special tools.

(F) BEARINGS: The bearings for each end of the roller shaft which supports the curtain shall be self-lubricating bronze bearings, self-lubricating graphite bronze bearings, permanently lubricated and sealed ball bearings, or permanently lubricated and sealed roller bearings as recommended by the Door Manufacturer for the type and size of door to be installed.

(G) BRACKETS: Fabricate brackets of heavy cast iron or steel; design brackets to close the ends of roller-

shaft housing and to form a supporting ring for hood. Ends of roller shaft shall be journaled into bracket hubs to provide ample bearing for required load. (The exposed surfaces of brackets for doors at opening Nos. ..... shall be given a dull chrome finish applied over a suitable plating, or shall be covered with stainless steel trim to match the finish on adjacent door surfaces.)

(H) HOODS: Construct hoods of metal, not lighter than (24 gauge stainless steel)—(22 gauge galvanized steel) and form to fit contour of end brackets. Reinforce hoods with rods, rolled beads, or stiffened flange at top and bottom edges. Provide intermediate supporting brackets for hoods at openings more than 12 feet in width. Provide a weather baffle at the lintel of each exterior door. Where hood is exposed to weather, provide flashing into building walls.

(I) LOCKING DEVICE: Each manually operated (exterior)—(interior) stainless steel rolling door shall be fitted with manufacturer's standard chain or bar type locking device. (The locking device shall be of type to receive a padlock with ..... inch shank.)—(The locking device shall be fitted with a cylinder lock suitable for keying to the building lock system.) The (padlock)—(lock cylinder) will be master keyed into the building lock system and furnished to the door manufacturer by the .....

(J) DOOR OPERATION: Shall be provided as follows:

(1) MANUAL PUSH-UP OPERATION—*(For doors up to 80 sq. ft.):* Doors at opening Nos. ..... shall have one lifting handle on each side fastened to bottom rail; provide pulldown straps, or pole hooks on bottom rail of doors over 7-feet high. Provide one pole for each door having pole hooks. Doors shall be counter-balanced and adjusted to provide easy operation with a maximum pull of (20)—(25) pounds required for lift handle operation.

(2) MANUAL HAND CHAIN OPERATION: Doors at opening Nos. ..... shall have a galvanized, endless type chain operating over a sprocket and extending to within 2 feet of floor. Gears shall be high grade gray iron, cast from machine cut patterns with reduction calculated to reduce pull required on hand chain to (20)—(25) pounds maximum.

(3) MANUAL CRANK AND GEAR OPERATION: Doors at opening Nos. ..... shall have a removable crank located approximately 34 inches from floor. Gears shall be of high grade gray iron cast from machine cut patterns with reduction calculated to reduce pressure exerted on crank to (20)—(25) pounds maximum.

(4) ELECTRIC POWER OPERATION: Doors at opening Nos. ..... shall have electric power operators complete with electric motors, operators, controls and switches as hereinafter specified.

(K) METAL AND FINISH: The type of stainless steel and other metals in connection with rolling service doors shall be as hereinbefore specified with the various parts finished as follows: SEE NOTE 2

(1) Exposed to view surfaces of stainless steel for curtain slats, bottom rail, hood, guides and ..... for doors at opening Nos. ..... shall have a No. ..... finish; all other exposed to view stainless steel surface shall have a ..... finish.

(2) Exposed ferrous metal surfaces in connection with stainless steel doors, except bearings, chains and ..... shall have (finish as hereinbefore specified for the item)—(manufacturer's standard finish)—(a ..... finish).

6. STAINLESS STEEL ROLLING SHUTTERS: SEE NOTE 5

(A) TYPE AND OPERATION: Rolling shutters shall be of stainless steel, overhead coiling type, flat design, of sizes indicated, complete with necessary guides, head enclosure, hardware, anchors, mechanisms and accessories as indicated and specified.

(1) Shutters at counter opening Nos. ..... shall be a factory assembled unit with integral frame, sill, trim and head enclosure as manufactured by ..... Shutter shall be manually operated by means of (lifting handles)—(crank-gear with removable handle).

(2) Shutters at opening Nos. ... shall be similar to Model No. ..... as manufactured by .... Shutter units shall (be furnished with integral frames, sill, trim and head enclosure)—(be without integral frames and trim). Shutter operation shall be (manually by lifting handles)—(manually by crank-gear with removable handle)—(manually by chain-gear)—(with electric power operator with auxiliary chain-gear or crank-gear operation). Shutters shall be (surface mounted on face of wall)—(between-jamb mounted with head mechanism concealed above the head of opening)—(between-jamb mounted with head mechanism enclosed with square hood exposed below the head of opening). Provide removable soffits or panels as required for access to head enclosure.

(3) Similar type shutters as manufactured by .... or ..... may be used, provided they conform to requirements indicated and specified.

(B) CONSTRUCTION AND FINISH: Construction of rolling shutters, (frames)–(sills)–(trim) and accessories shall be in accordance with the manufacturer's current published specifications for the type of shutter specified, in stainless steel construction, and shall include the special features and modifications as indicated and specified.

(1) Guides for shutters shall be constructed of roll-formed stainless steel or extruded aluminum to the required shapes and of gauges standard with the manufacture. Guides shall be designed to receive the end locks and, in addition, be fitted with continuous silencer strips of wool pile or other suitable material to reduce wear and provide quiet operation. Silencer strips shall be designed for easy replacement.

(2) Curtains shall be fabricated of (24)—(22) US Standard gauge stainless steel slats of flat design with stainless steel endlocks riveted to each end of each alternate slat. Equip curtains with wind locks of manufacturer's standard design.

(3) Stainless steel for frames, sills, hoods, trim etc. shall be fabricated to sizes and designs indicated with exposed joints flush and smooth. Provide closed ends for sills and .....
Metal shall be of the following U.S. Standard minimum gauges:
Jambs, heads and trim: (16)—(....) gauge.
Sills: (14)—(....) gauge.
Head enclosure and fascia: (20)—(22) gauge.
Exposed hood: (20)—(22) gauge.

SEE NOTE 2

(4) The exposed to view surfaces of all stainless steel in connection with the shutters and frames shall have a (No. 4 satin finish)—(No. ..... finish) to match approved samples. Exposed ferrous metal in connection with stainless steel shutters shall have a dull chrome finish applied over a suitable plating, or shall be covered with stainless steel to match adjacent surfaces.

(5) Shutters (except power operated) shall be provided with a (stainless steel or chrome plated bronze cylinder locking device operable from either side of shutter)—(padlocking device consisting of stainless steel slide bars and hasps). Locate locking device as indicated on approved shop drawings. The (padlocks)—(lock cylinders) will be master keyed into building lock system and furnished to the shutter manufacturer by the .....

SEE NOTE 6

7. STAINLESS STEEL ROLLING GRILLES:

(A) TYPE AND OPERATION: Rolling grilles shall be of stainless steel, overhead coiling type, of sizes indicated, complete with necessary guides, heads, hardware, fastenings, mechanisms and accessories as indicated and specified.

(1) Grilles for opening Nos. ..... shall be similar to model No. ..... as manufactured by .....
and be manually operated by means of (lifting handles and counter-balances)—(chain-gear operator)—(crank-gear operator).

(2) Grilles for opening Nos. ..... shall be similar to model No. ..... as manufactured by .....and be electric-power operated with auxiliary chain-gear operation.

(3) Similar type grilles as manufactured by .....
..... or .....
may be used, provided they comply with requirements indicated and specified.

(B) MOUNTING: Grilles shall be (surface mounted on face of wall)—(between-jamb mounted with square hood concealed above the head of opening and have removable soffit)—(between-jamb mounted with square hood exposed below the head of opening and have a removable panel) as indicated.

(C) CONSTRUCTION AND FINISH: Construction of grilles shall be in accordance with manufacturer's current published specifications for the model number specified, in stainless steel construction, and shall include the special features and modifications as indicated and specified.

SEE NOTE 2

(1) The exposed to view surfaces of stainless steel for the grille curtain, hood and .....
at opening Nos. ..... shall have a .....
..... finish. All other exposed to view stainless steel surfaces shall have a .....
finish. Exposed ferrous metal surfaces in connection with stainless steel grilles, except bearings, chains and ..... shall have (manufacturer's standard finish)—(a .....
.... finish).

(2) (The openings in grille curtain shall be designed to prevent the passage of an object greater than 1¾ inch diameter.)

(3) Grilles (except power operated) shall be provided with a (stainless steel or chrome plated bronze cylinder locking device operable from either side of grille)—(padlocking device consisting of a stainless steel slide bar, or throw bar, engaging holes in back of guides). Locate locking device in tubular bottom rail or .....
..... (Locks, cylinders and padlocks will be master keyed into building lock system and furnished to the grille manufacturer by the ....)

(4) Provide a suitable spring adjusting device on each grille; locate device to permit easy adjustment of spring balances without removing the hood, (except that manual push-up grilles may have spring adjusting device on inside of hood).

(5) The metal for the guides and hoods shall be stainless steel of gauges standard with the manufacturer and the same kind and finish as specified for the grille, except as designated otherwise.

8. ELECTRIC POWER OPERATORS:

SEE NOTE 7

(A) GENERAL REQUIREMENTS: Electric power operators shall be provided for rolling (doors)—(grilles)—(shutters) at opening Nos. ..... Operators shall be of type recommended by the (door)—(grille)—(shutter) manufacturer and shall be complete with elec-

tric motor, machine-cut reduction gears, magnetic brake, brackets, push button controls, limit switches, magnetic reversing starters, and other accessories specified or necessary. All high speed gearing shall be enclosed within a bath of oil or special grease. The power operator shall be so designed that the motor may be removed without disturbing the limit-switch timing, and without affecting the emergency auxiliary operators. Make provisions for immediate emergency manual operation of door in case of electrical failure; arrange the emergency operating mechanism so that it may be placed in and out of operation from the floor and its use shall not affect the timing of the limit switches. Provide a suitable arrangement or device to disconnect the motor from the emergency manual operating mechanism when engaged.

(B) MOTORS: Motors shall be high-starting torque type, of sufficient horsepower and torque output to move (door)—(grille)—(shutter) in either direction from any position and produce a door travel speed of not less than two-thirds, or more than one foot per second, without exceeding the rated capacity. Motors shall conform to the standards of the National Electrical Manufacturer's Association and be suitable for operation on . . . . . volt, 60 cycle, 3 phase alternating current, (except that motors of one horsepower or less may be single phase provided they are instantly reversible type). Install motors in an approved location.

(C) CONTROLS: Each motor shall have an enclosed reversing across-the-line type magnetic starter having thermal-overload protection, unless protection is provided in the motor; solenoid-operated brake; limit switches; and remote control switches at locations indicated on drawings or specified. The starters and controls shall conform to the National Electrical Manufacturer's Association, National Control Standard.

(D) SWITCHES: Remote control switches shall be located on (inside)—(outside) the building as indicated (or specified). Each switch control station shall be three-button type, with the buttons marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" buttons shall require only momentary pressure by the operator. The "CLOSE" button shall require constant pressure by the operator to maintain closing motion of the door. When the door is in motion and the "STOP" button is pressed, the curtain shall stop instantly and remain in the stop position; from the stop position, the curtain may then be operated in either direction by pushing the "OPEN" or "CLOSE" button. Push buttons shall be full guarded type to prevent accidental operation. Control switches mounted on the exterior of building shall be in a weatherproof enclosure; the enclosure shall be provided with (a cylinder lock that can be master keyed)—(an approved locking device operated by special key). Provide adjustable type limit switches to automatically stop the curtains at their fully open and closed positions.

(E) SAFETY DEVICE: The bottom edge of power operated (doors)—(grilles)—(shutters) shall have a safety device that will immediately (stop the curtain)—(stop and reverse the curtain) in its closing travel upon contact with an obstruction in the curtain openings. The safety device shall not substitute for a limit switch. Provide type "SO" cable equipped with spring loaded automatic takeup reel between control devices mounted on the curtain and fixed supports. The safety device shall operate on a 24 volt system.

(F) TRANSFORMERS: For power circuits in excess of 250 volts, provide a control transformer to reduce the voltage on control circuits to 120 volts.

(G) ELECTRICAL WORK: All manual or automatic control devices necessary for the proper operation of the (doors)—(grilles)—(shutters) shall be provided herein. All other electrical work in connection with (doors)—(grilles)—(shutters) is included under Section "Electrical Work."

9. INSTALLATION:

(A) Doors (and grilles)—(and shutters) shall be installed by the manufacturer or his authorized representative, in accordance with details, approved shop drawings and manufacturer's directions. All anchors and inserts for guides, brackets, (motors)—(controls)—(switches) and other work shall be accurately located. Upon completion, doors (and grilles)—(and shutters) shall be free from warp, twist or distortion and shall be lubricated and properly adjusted to operate freely.

10. PROTECTION AND CLEANING:

SEE NOTE 8

(A) PROTECTION: Protect doors, grilles, shutters, frames and accessories from damage of any kind during handling, transportation and at the job site. Remove any protective tape or coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect doors and frames from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel doors, (grilles)—(shutters)—and frames shall have all smears of compounds, tapes and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturers of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel surfaces is included in another section of the project specification and is not a part of the rolling door contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish Owner with complete maintenance instructions for adjusting mechanism of doors, grilles and shutters and for cleaning and maintaining exposed metal surfaces.

Suggested Guide Specifications for

Stainless Steel Windows

Notes for Specification Writer

GENERAL NOTES

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used for numbering the project specifications, the Stainless Steel Window Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Doors, Windows and Glass" and be numbered accordingly.

ARRANGEMENT OF TEXT: This section includes guide specifications for:

Reversible Windows
Fixed Windows
Projected Windows
Double-Hung Windows
Horizontal Sliding Windows
Top-Hung Inswinging Windows

To avoid lengthy descriptions of repetitive items under each window type, paragraph 5 entitled "General Requirements" contains information which is common to most all windows. This arrangement will reduce or eliminate some of the description for specific items under the individual window types. Window types that are not needed for a project specification may easily be crossed out and omitted without disturbing the types to be included.

WINDOW IN CURTAIN WALLS: On projects having curtain wall construction fitted with stainless steel windows, it may be desirable to include the curtain wall windows as part of the curtain wall section in order to simplify the work and avoid a divided responsibility.

SASH TO RECEIVE INSULATING GLASS: Where insulating glass (double glazing) is required, the specification should require sash members, glazing beads, and hardware to be of sufficient size and strength to receive and support the glass of thickness shown.

An allowance of ⅛ inch minimum should be made between each side of insulating glass and metal frame to allow for glazing compound and expansion. A minimum of ⅛ inch should also be allowed between edges of glass and frame.

Before specifying insulating glass for windows made from stock sections, a check should be made with the glass manufacturer and also the window manufacturer to determine their recommendations for setting the glass.

When insulating glass is used for double-hung windows, it may be necessary to increase the size of sash balances to compensate for the additional weight.

NOTES FOR SPECIFIC ITEMS

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade section. A list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings and schedules clearly indicate the extent and locations of all items to be in-

cluded under this section, the entire paragraph could be omitted.

NOTE 2: On large projects having custom-built windows, or when quality or workmanship requires close inspection, it is desirable to require a full size sample window unit of each basic window type specified. These samples should be complete with the proper finish, hardware, weatherstripping, anchors, screens and other accessories. Since the cost for such samples is usually charged to the job, the specification should state that the approved sample windows may be installed in the project, providing they are properly identified and their location recorded. On small projects or where stock windows are used, samples of a typical corner section of frame and ventilators are usually sufficient to show the construction, finish and size of sections. In such cases, loose samples of hardware should be requested.

NOTE 3: Paragraph 5 contains overall general requirements which are applicable to most all window types. It is intended that this paragraph be used in conjunction with each window type, and that all specific requirements be included under the paragraph headings of "Modifications and Specific Requirements" for each window type. When preparing project specifications, the specific requirements for the various window types should be checked against paragraph 5 to prevent duplication or conflict.

NOTE 4: Because of the variations in alloy types and gauges used, as well as the cost differentials of different alloys and gauges, the exact type of stainless steel should be determined and specified for each project. Generally the alloyTypes most commonly used for windows are 302, 304 and 301. (For complete description of each alloy type designation, with recommended uses and description of mechanical properties, refer to "Stainless Steel Architectural Fact Sheet," latest, prepared by the International Nickel Company, Inc. in cooperation with Committee of Stainless Steel Producers, American Iron and Steel Institute.)

NOTE 5: It is intended that the name of window manufacturer, the model or series number of window unit desired and all special features and accessories be included in this paragraph. Refer to manufacturers' catalogues for special and optional features. When subparagraph (1) is included in a project specification to permit the use of similar windows of other manufacturers, the specification writer should determine:

a. That the optional manufacturers listed can produce the type and quality of windows specified, and in comparable price ranges.
b. That all items and requirements for which a similar product must comply are listed; if this is not done, it could lead to numerous submissions of products that are not acceptable, and therefore cause delays and additional investigating, testing, and expense.

NOTE 6: The manufacturers of stainless steel windows utilize many different methods of construction and type and gauges of metal to produce the finished product. Generally, each manufacturer utilizes the alloy type and the gauges of metal that will produce the best results with his type of window construction; the available metal

forming and fabricating equipment and the finishes used are also a factor.

Therefore, these Suggested Guide Specifications have been prepared in a manner that will make the Manufacturer's own published specifications for the windows specified the basis for the Construction Requirements.

The manufacturer's specification should be modified by the project specifications to suit individual job conditions. Some of the items that may require modification have been listed under each window type. Where modifications are not required, the corresponding subparagraphs under paragraph entitled "Modifications and Specific Requirements" of these Guide Specifications may be omitted entirely in many cases.

When a manufacturer's specification is made a part of the project specification by reference, a copy of the Referenced Manufacturer's Specification should be made available to bidders during the bidding period and a copy should be available at the project site during the construction period.

NOTE 7: When gauges of metal heavier than those listed in the Manufacturer's Specifications are considered necessary for special applications, a check should first be made with the Window Manufacturers to determine whether their forming and fabricating equipment can adequately handle the heavier metal.

NOTE 8: The type of locking arrangements, safety features and hold-open devices for reversible windows and top-hung inswinging windows vary with the window manufacturers. The relation of sash width and height to the number of locks required is also a variable factor with some manufacturers. Before specifying the detailed locking requirements, check with window manufacturers for recommendations and available types; also check with building owner for window washing and operating requirements.

NOTE 9: The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the window Sub-Contract. However, the final cleaning is specified to be included under another section of the project specification. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the Work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" or "Special Conditions" Sections of the project specifications.

When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish used should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

Issued: March 1964
Revised: January 1966

Stainless Steel Windows

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel windows, ... and related items necessary to complete the work indicated on drawings and described in specifications.

SEE NOTE 1

(B) ITEMS INCLUDED: In general the work shall include the following items:

(1) ..... Type windows.
(2) ..... Type windows.
(3) Window mullions.
(4) Insect screens.
*(5) Casings and trim.
(6) Anchors and fastening devices.
(7) Hardware, weatherstripping and glazing beads.
*(8) Metal closure panels between window mullions and partition ends.
*(9) Glass and glazing for ..... type windows.
(10) Metal to metal caulking of frames and framing members.
(11) Accessories as specified.
(12) Installation of all items specified, unless designated otherwise.
(13) Initial cleaning of exposed stainless steel surfaces.
( ) .....

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications:

*(1) Glass and glazing.
(2) Caulking, except as specified herein.
(3) Structural building supports at mullions between window units.
(4) Attachment of window shades and venetian blinds.
*(5) Metal closure panels between window mullions and partition ends.
(6) Metal curtain wall framing members and panels.
(7) Cleaning of glass in windows after installation.
(8) Final cleaning of stainless steel.
( ) .....

*Indicates items that may be included either in this section or in other sections depending upon individual project requirements.

(D) ALTERNATES: Note that alternate No. ..... affects the work required under this section. Refer to Bid Form and to Section ..... for a detailed description of the alternates requested with bid.

2. SHOP DRAWINGS:

(A) Submit ..... copies of shop drawings of stainless steel windows and accessories to Architect for approval. Submit drawings in accordance with requirements described in Section ..... Obtain approval of draw-

ings prior to proceeding with manufacturing.

(1) Shop drawings shall indicate elevations of windows, full size sections, thickness and gauges of metal, fastenings, proposed method of installation and anchoring, the size and spacing of anchors, method of glazing, locations of operating hardware, mullion details, method and materials for weatherstripping, method of attaching screens, details of installation and connections with other work.

SEE NOTE 2

3. SAMPLES:

(A) Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements as stated in section No. ..... General Conditions. Submit samples in triplicate unless otherwise specified or directed. Approval must be obtained prior to fabrication or delivery.

(1) Samples approximately 3 by 6 inch size of stainless steel in each finish specified.

(2) Samples (or cuts) of each item of hardware proposed for use.

(3) One full size window unit of each type specified.

( ) .....

4. COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS:

(A) Any material or operation specified by reference to the published specifications of a manufacturer, The American Society for Testing and Materials (ASTM), The National Association of Architectural Metal Manufacturers (NAAMM), or other published standard, shall comply with the requirements of the current specification or standard listed. In case of a conflict between the referenced specification and the project specifications, the project specifications shall govern.

(B) The Contractor, if requested shall furnish an affidavit from the manufacturer, certifying that the materials or product delivered to the job meets the requirements specified.

SEE NOTE 3

5. GENERAL REQUIREMENTS:

(A) SIZES AND COMBINATIONS: Furnish windows of sizes and combinations indicated; locate ventilators and fixed or stationary units as detailed.

SEE NOTE 4

(B) TYPE OF EXPOSED METAL, FINISH AND FASTENINGS: All exposed metal for windows, framing members and ..... shall be mechanically leveled stainless steel, conforming to ASTM Specification A 167-63, Type 302 or Type 304, or Type ..... All bolts, screws and fastenings in finished work shall be stainless steel, of color and finish to match the adjacent stainless steel surface; use Type 305, for exposed locations and either type 305 or 410 for locations protected from weather. The gauges of stainless steel required shall be standard with the window manufacturer unless other gauges are indicated on drawings or specified as a modification.

(1) Exposed surfaces of stainless steel shall have (a No. 4 smooth satin finish)—(a ..... finish) to match approved sample. Stainless steel for concealed reinforcing and other unexposed surfaces shall not require any special finish.

(C) CONSTRUCTION AND WORKMANSHIP: Construct windows to produce results specified and to assure neat appearance. Joints between members shall be made rigid by continuous welding, mechanical fastenings, or other methods to maintain the structural value of members connected. Welded joints shall be solid, have excess metal removed, and dressed smooth on exposed and contact surfaces. The dressing shall be done so that no discoloration or roughness will show after finishing. Joints formed with mechanical fastenings shall be closely fitted and made permanently watertight. Except as designated otherwise, frames, sash and ventilators shall be assembled at the plant, and shipped as a unit with hardware attached.

(D) PERFORMANCE TESTS: Windows shall conform to the requirements for loading, air infiltration and and water tests when specified under the individual window types. Prior to approval of sample windows, the manufacturer shall submit certified reports prepared by an approved commercial testing laboratory and showing that the windows proposed for use comply with the tests specified. (Tests may be waived provided the manufacturer can furnish certified reports which are satisfactory to Architect and show that windows previously manufactured by him, of the same type as proposed, have met or exceed the test requirements specified).

(1) Unless designated otherwise, the testing equipment and procedure shall be performed under conditions similar to those described in Section 8, current edition, of the Metal Curtain Wall Manual, published and distributed by the National Association of Architectural Metal Manufacturers-(NAAMM).

a. Air filtration tests shall be conducted in accordance with Test B, by static pressure, as specified for metal curtain walls. (Paragraph IV, test Procedures).

b. Water infiltration test shall be conducted in accordance with test C-1, by static pressure, as specified for metal curtain walls. (Paragraph IV, Test Procedure).

c. Loading tests shall be conducted in accordance with Tentative NAAMM Standard—"Specifications for Loading Tests on Metal Windows" and based on the Quality Grades as specified.

(E) ACCESSORIES: Furnish all hardware, fastenings, clips, fins, anchors, and other appurtenances necessary for complete installation of windows and operation of

ventilators. Except as otherwise indicated or specified, anchors and fastenings shall be stainless steel, galvanized steel, or other metal compatible with stainless steel.

(F) MULLIONS: Provide mullions between multiple-window units where indicated; fasten mullions to adjacent window units in a manner to permit expansion and contraction. (When specifically required, mullions shall be anchored to adjoining construction at heads and sills). (Mullions between windows requiring window cleaners bolts shall be anchored to adjoining construction in a manner to provide safe and adequate supports for the window cleaner. Where cleaners bolts are fastened to mullions, the backs of mullions shall be reinforced as specified for the window frames). Stainless steel mullion covers (of manufacturers' stock design)—(of design indicated) shall be provided (on the interior)—(on the exterior) to completely close all exposed joints and recesses between window units and to present a neat appearance. Stainless steel structural supports at mullions shall be provided as indicated.

(G) PROVISIONS FOR GLAZING: Sash shall be designed to receive glass of thickness indicated or specified. Glazing shall be performed in the field unless designated otherwise. The method for securing glass shall consist of removable metal glazing beads or flexible glazing gaskets as specified for each individual window type. (Metal glazing beads shall be stainless steel, designed for use with glazing tapes, and glazing compounds or with flexible glazing channels; they shall be either snap-on types of a manufacturer's standard design and of proper size for the glass specified). Beads and gaskets shall be carefully fitted by mitering or coping at corners and to produce watertight joints.

(H) HARDWARE—GENERALLY: The items, type and function of hardware required shall be as specified under each individual window type. Hardware shall be of suitable design and have sufficient strength to perform the function for which it is used; it shall be attached securely to the windows with non-corrosive bolts or self-tapping screws; sheet metal screws will be permitted only for .....
Where fixed screens are required, the hardware shall be especially adapted to permit satisfactory operation of ventilators. Except as specified under each individual window type, exposed hardware shall be of stainless steel or other corrosion-resistant material that is compatible with stainless steel and having a suitable finish to match adjacent surfaces.

(I) POLE OPERATORS: Construct poles of hardwood with a varnish finish, or of tubular aluminum; fit lower end with a rubber tip and upper end with malleable iron, aluminum or bronze hook of proper shape. Provide one pole hanger for each pole. The number of poles to be provided shall be as specified under the individual window type. Poles shall be of length required to operate windows.

(J) WEATHERSTRIPPING: Provide weatherstripping for all ventilating sash. Weatherstripping shall be manufacturer's standard type, easily replaceable, and of a material that is compatible with the metal to which it will be in contact.

6. REVERSIBLE TYPE WINDOWS:

(A) TYPE AND MANUFACTURE: Windows indicated on drawings as type Nos. ....., shall be Series No. ..... stainless steel reversible type as manufactured by .....
Windows shall rotate around the vertical pivots to permit cleaning both faces of glass from inside the building. Where indicated on drawings, reversible windows shall (have integral hopper ventilators in lower section of sash unit)—(have separate hopper ventilators in lower section of frame unit). SEE NOTE 5

(1) Similar type windows as manufactured by .... or ..... may be used, provided they comply with requirements indicated and specified for: sizes, finish, workmanship, weathertightness, performance, appearance and .....

(B) CONSTRUCTION REQUIREMENTS: Reversible type windows, frames, hardware and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements indicated on project drawings and described in project specifications. SEE NOTE 6

(C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for reversible windows: SEE NOTE 7

(1) **Finish:** The exposed surfaces of stainless steel shall have a ..... finish to match the approved sample.

(2) **Type of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads).

(3) **Hardware for Reversible Sash:** Each reversible sash shall be equipped with a minimum of two concealed locks, except that sash (4)-(6)-(8)-feet and over in height shall be equipped with four locks. Locks shall be located in the sash or frame, be operated by lever type removable keys and shall provide a positive safety feature against unauthorized opening of sash and also to prevent the sash from swinging free after the initial opening. The sash unit shall lock automatically when it reaches the 180 degree, (window washing) position. (Provide removable steel stay bars to hold the pivoted sash open for emergency ventilation; furnish a total of ..... SEE NOTE 8

stay bars to be used at locations as directed). (Stainless steel stay bars to hold the pivoted sash open for emergency ventilation shall be provided for windows in Room Nos. . . . . The bars may be either removable type or incorporated as a part of the window construction and attach thereto.) Provide pull handles on sash as required.

(4) **Hardware For Hopper Vents:** Projected hopper vents shall be provided with stainless steel balance arms and adjustable nylon or other approved sliding pivots. Each vent shall have a cam-type or snap-type lever handle fastener, except that vents over (42 inches)—(. . . . . inches) wide shall have two fasteners.

(5) **Air Infiltration:** Windows shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). The air infiltration of reversible sash shall not exceed (⅛ cu. ft.)—(. . . . . cu. ft.) per minute, per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 50 miles per hour. (The air infiltration for adjacent hopper type projected sash shall not exceed (½ cu. ft.)—(. . . . . cu. ft.) per minute, per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 25 miles per hour. The normal size of the reversible sash tested shall be approximately . . . . . wide by . . . . . high and the normal size of the hopper ventilators tested shall be approximately . . . . . wide by . . . . . high.)

(6) **Water Infiltration:** Windows shall be tested for water leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). No water shall pass the interior face of window frame during the test period.

(7) **Loading Tests:** Windows shall be tested for strength performance under concentrated loads as follows: . . . . . .

7. FIXED TYPE WINDOWS:

SEE NOTE 5 (A) TYPE AND MANUFACTURE: Windows indicated on drawings as type Nos. . . . . shall be Series No. . . . . stainless steel fixed type as manufactured by . . . . . (Where indicated on drawings fixed windows shall have separate hopper ventilators in lower section of frame unit).

(1) Similar type windows as manufactured by . . . . . or . . . . . may be used, provided they comply with requirements indicated and specified for: sizes, finish, workmanship, weathertightness, performance, appearance and . . . . . .

SEE NOTE 6 (B) CONSTRUCTION REQUIREMENTS: Fixed type windows, frames and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements indicated on project drawings and described in project specifications.

SEE NOTE 7 (C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for fixed windows:

(1) **Finish:** The exposed surfaces of stainless steel shall have a . . . . . finish to match the approved sample.

(2) **Types of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads or trim) as indicated.

(3) **Air Infiltration:** Windows shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). The air infiltration of fixed sash shall be *nil* when subjected to a static air pressure equivalent to a wind velocity of 100 miles per hour. (The air infiltration of ventilating hopper sash shall not exceed (½ cu. ft.)—(. . . . . cu. ft.) per minute per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 25 miles per hour). (The nominal size of the hopper ventilator tested shall be approximately . . . . . wide by . . . . . high).

(4) **Water Infiltration:** Fixed windows (and hopper ventilators) shall be tested for water leakage (in accordance with NAAMM procedure hereinbefore described). (In accordance with the Manufacturer's standard procedure). No water shall pass the interior face of window frame during the test period.

(5) **Hardware For Hopper Vents:** Projected hopper vents shall be provided with stainless steel balance arms and adjustable nylon or other approved sliding pivots. Each vent shall have a cam-type or snap-type lever handle fastener, except that vents over (42 inches)—(. . . . . inches) wide shall have two fasteners. (Ventilators with locking rails more than 6 feet above the floor shall have hardware designed for pole operation; provide one pole and one pole hanger for each room where pole operated windows occur).

8. PROJECTED TYPE WINDOWS:

SEE NOTE 5 (A) TYPE AND MANUFACTURE: Windows indi-

cated on drawings as type Nos. . . . . shall be Series No. . . . . stainless steel projected type as manufactured by . . . . . Ventilators shall project in, or project out as indicated.

(1) Similar type windows as manufactured by . . . . . or . . . . . may be used, provided they comply with requirements indicated and specified for: sizes, finish, workmanship, weathertightness, loading tests, performance, appearance and . . . . . .

SEE NOTE 6 (B) CONSTRUCTION REQUIREMENTS: Projected type windows, frames, hardware and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements indicated on project drawings and described in project specifications.

SEE NOTE 7 (C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for projected windows:

(1) **Finish:** The exposed surfaces of stainless steel shall have a . . . . . finish to match the approved sample.

(2) **Type of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads).

(3) **Hardware:** Each projected ventilator shall be provided with two concealed stainless steel stay arms sliding in friction shoes. Stay arms shall hold ventilator in any position, up to 45 degrees.

a. Each projected ventilator shall have a cam-type lever handle fastener, except that ventilators over 42 inches wide and not pole operated shall have two fasteners.

b. Ventilators with locking rails more than 6 feet above the floor shall have hardware designed for pole operation; provide one pole and one pole hanger for each room where pole operated windows occur.

c. Where fixed screens occur at projected out ventilators, provide underscreen push bar operators, or provide a sliding or hinged wicket in the screen.

(4) **Air Infiltration:** Windows shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). The air infiltration of ventilating sash shall not exceed (½ cu. ft.)—(. . . . cu. ft.) per minute per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 25 miles per hour. The normal size of the ventilator to be tested shall be . . . . . wide by . . . . . high.

(5) **Water Infiltration:** Windows shall be tested for water leakage (in accordance with NAAMM procedure hereinfore described)—(in accordance with the Manufacturer's standard procedure). No water shall pass the interior face of window frame during the test period.

(6) **Loading Tests:** Windows shall be tested for strength performance in accordance with NAAMM procedure hereinbefore described. The windows shall meet all requirements as designated for ("A" Quality and classified as Monumental Grade)—("B" Quality and classified as Commercial or Institutional Grade) Projected Windows.

9. DOUBLE-HUNG TYPE WINDOWS:

SEE NOTE 5 (A) TYPE AND MANUFACTURE: Windows indicated on drawings as type Nos. . . . . , shall be Series No. . . . . stainless steel double-hung type as manufactured by . . . . . Windows indicated as type Nos. . . . . shall be in combination with (fixed glass units)—(projected hopper vents at sill or transom) as indicated.

(1) Similar type windows as manufactured by . . . . . or . . . . . may be used, provided they comply with requirements indicated and specified for: size, finish, workmanship, weathertightness, loading tests, performance, appearance and . . . . . .

SEE NOTE 6 (B) CONSTRUCTION REQUIREMENTS: Double-hung type windows, frames, hardware and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements as indicated on project drawings and described in project specifications.

SEE NOTE 7 (C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for double-hung windows:

(1) **Finish:** The exposed surfaces of stainless steel shall have a . . . . . finish to match the approved sample.

(2) **Type of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads).

(3) **Sash Balances:** Provide two spiral or coil spring type balances for each sash unit, unless otherwise specified. Enclose balances in rustproof cases and make face plates of stainless steel with same finish as window frames. Provide access to balances for adjustments. (Sash units less than . . . . . inches wide may have only one balance).

(4) **Hardware:** Each double-hung window shall have (one)—(two) sash locks at the meeting rail. The

lower sash shall have two applied lifts, or one continuous integral or applied lift at the bottom rail of the lower sash. The upper sash shall have two outside pulldown handles or a continuous integral pulldown member on the underside at the meeting rail.

a. Where the meeting rails are over 6 feet above the floor, pulldown handles shall be omitted, and the upper sash shall have a pulldown socket on the inner side of the top rail to permit operation by pole. Provide one pole and one wall-mounted pole hanger for each room where pole operation is required.

b. Where projected hopper type vents occur below or above double-hung sash, each vent shall have a cam-type or snap-type locking handle, hinges, and friction stay arms. Hopper vents more than 42 inches wide shall have two locking handles. (Approved type of friction stay arms and sliding pivots may be used in place of hinges).

(5) **Provision for Window Cleaners' Bolts:** Windows specified hereinafter to have window cleaners' bolts shall have the frames reinforced and equipped with special wall anchors to receive the bolt as specified.

(6) **Air Infiltration:** Windows shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). The air infiltration shall not exceed (½ cu. ft.)—(..... cu. ft.) per minute per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 25 miles per hour. The nominal size of the window to be tested shall be approximately ..... wide by ..... high.

(7) **Water Infiltration:** Windows shall be tested for water leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). No water shall pass the interior face of window frame during the test period.

(8) **Loading Tests:** Windows shall be tested for strength performance in accordance with NAAMM procedure hereinbefore described. The windows shall meet all requirements as designated for ("A" Quality and classified as Monumental Grade)—("B" Quality and classified as Commercial or Institutional Grade) Double-Hung Windows.

10. HORIZONTAL SLIDING TYPE WINDOWS:

SEE NOTE 5

(A) TYPE AND MANUFACTURE: Windows indicated on drawings as type Nos. ....., shall be Series No. ..... stainless steel horizontal sliding type as manufactured by ..... Ventilator units shall be (single sliding)—(double sliding) in connection with stationary units as indicated.

(1) Similar type windows as manufactured by ..... or ..... may be used, provided they comply with requirements indicated and specified for: sizes, finish, workmanship, weathertightness, loading tests, performance, appearance and .....

SEE NOTE 6

(B) CONSTRUCTION REQUIREMENTS: Horizontal sliding windows, frames, hardware and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements as indicated on project drawings and described in project specifications.

SEE NOTE 7

(C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for horizontal sliding windows:

(1) **Finish:** The exposed surfaces of stainless steel shall have a ..... finish to match the approved sample.

(2) **Type of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads).

(3) **Operation:** Ventilating sash shall be provided with (nylon or nylon-tired rollers with sealed ball bearings)—(approved anti-friction sliding members at sill to prevent metal to metal contact during operation and to assure smooth operation of the ventilators). Sill members shall have weep holes to allow water to drain outward. Ventilating sash shall be easily removable from inside the building.

(4) **Hardware:** Each ventilator shall have pull handle and locking device that will prevent opening or removal of sash from outside when locked. (The locking device shall be designed to lock the ventilator in the closed position and in (two)—(three) different open positions).

(5) **Air Infiltration:** Windows shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturers standard procedure). The air infiltration of ventilating sash shall not exceed (¾ cu. ft.)—(..... cu. ft.) per minute per lineal foot of sash perimeter when subject to a static air pressure equivalent to a wind velocity of 25 miles per hour. The nominal size of the window to be tested shall be approximately ..... wide by ..... high.

(6) **Water Infiltration:** Windows shall be tested for water leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturers standard procedure). No water shall pass the interior face of window frame during the test period.

(7) **Loading Tests:** Windows shall be tested for strength performance under concentrated loads as follows: .....

11. TOP-HUNG INSWINGING TYPE WINDOWS:

SEE NOTE 5 (A) TYPE AND MANUFACTURE: Windows indicated on drawings as type Nos. ....., shall be Series No. ..... stainless steel top-hung inswinging windows (with inswinging projected hopper ventilators) as manufactured by .....
The operation of windows shall permit both sides of glass to be washed from interior of building.

(1) Similar type windows as manufactured by .... or ..... may be used, provided they comply with requirements indicated and specified for: sizes, finish, workmanship, weathertightness, loading tests, performance, appearance and .....

SEE NOTE 6 (B) CONSTRUCTION REQUIREMENTS: Top-hung windows, frames, hopper ventilators, hardware and accessories shall be constructed in accordance with the current published specifications of the window manufacturer for the type and series number of the windows listed, and including all modifications and other requirements indicated on project drawings and described in project specifications.

SEE NOTE 7 (C) MODIFICATIONS AND SPECIFIC REQUIREMENTS: The following requirements shall take precedence over any similar requirements described in the above referenced manufacturer's specifications for top-hung inswinging windows:

(1) **Finish:** The exposed surfaces of stainless steel shall have a ..... finish to match the approved sample.

(2) **Type of Glazing Beads:** Windows shall be provided with (stainless steel glazing beads)—(flexible glazing gaskets)—(a combination of flexible setting channels and stainless steel beads).

SEE NOTE 8 (3) **Hardware For Top Hung Sash:** Each top-hung sash shall have concealed stainless steel side arms on each side which will lock the sash in an open position for cleaning. Each sash shall have a minimum of 2 key operated locks and sash over ..... feet high shall have a minimum of 4 locks. Keys shall be lever handle type and removable only after window has been closed and locked. Furnish (one key operator for each window unit)—(a total of ....., key operators). (Provide pull handles on bottom rail of each top-hung sash). Hinges, when used, shall be of stainless steel of sizes and spacing required.

(4) **Hardware For Hopper Vents:** Projected hopper vents shall be provided with stainless steel balance arms and adjustable nylon or other approved sliding pivots to hold sash in any open position up to 45 degrees. Each vent shall have a cam-type or snap-type lever handle fastener, except that vents over (42 inches)—(..... inches) wide shall have two fasteners.

(5) **Air Infiltration:** Top-hung windows (and hopper ventilators shall be tested for air leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturer's standard procedure). The air infiltration of any operating sash shall not exceed (½ cu. ft.) —(..... cu. ft.) per minute per lineal foot of sash perimeter when subjected to a static air pressure equivalent to a wind velocity of 25 miles per hour. The nominal size of the top-hung sash tested shall be approximately ..... wide by ..... high and the nominal size of the hopper ventilator tested shall be ..... wide by ..... high.

(6) **Water Infiltration:** Windows shall be tested for water leakage (in accordance with NAAMM procedure hereinbefore described)—(in accordance with the Manufacturers standard procedure). No water shall pass the interior face of window frame during the test period.

(7) **Loading Tests:** Windows shall be tested for strength performance in accordance with NAAMM procedure hereinafter described. The window shall meet all requirements as designated for ("A" Quality and classified as Monumental Grade)—("B" Quality and classified as Commercial or Institutional Grade) for Projected Windows.

12. INSECT SCREENS

(A) EXTENT AND LOCATION: Insect screens shall be provided for ventilators of all windows in the following locations:

( ) .....
.....

(B) TYPE: Screens for double-hung windows shall be located on the outside of windows and shall be (full-length top-hung type)—(double vertical sliding type) —(half-length sliding type)—(half-length fixed type). Screens for horizontal sliding windows shall be located on (outside)—(inside) of window and be full length (top-hung stationary)—(horizontal sliding) type. Screens for projecting and hopper ventilators shall be stationary type, attached directly to the windows, and located on inside or outside of window frame as necessary.

(C) CONSTRUCTION: Screens shall be constructed with roll formed stainless steel frames in accordance with the current published specification of the Manufacturer of the windows to be screened and with modifications and other specific requirements as described herein:

(1) Screens shall fit closely around entire perimeter of each ventilator or opening, shall be easily removable from inside building, and interchangeable for same size ventilators of similar type windows.

(2) Hardware, guides, stops, clips, bolts and screws shall be furnished as necessary for a secure and insect tight attachment to window.

(3) The finish of screen frames shall match the finish specified for windows. The minimum gauge of metal for screen frames shall be ..... gauge.

(4) Screen hardware shall be manufacturer's standard type and finish, unless specified otherwise.

(5) The frames shall have removable splines of stainless steel or vinyl. Screening shall be (14 by 18 mesh stainless steel wire)—(14 by 18 or 14 by 16 mesh plastic-coated fibrous glass of a standard color as directed)—(16 by 16 mesh monel wire)—(14 by 18 mesh aluminum wire with a colored lacquer coating). Install screening with weave parallel with frames and sufficiently tight to present a smooth appearance. Edges of screening shall be concealed in the spline channel.

13. WINDOW CLEANER'S BOLTS:

(A) EXTENT AND LOCATION: Window cleaner's bolts shall be provided for all double hung, and .... type windows at the second story and above, except windows located so they may be removed for cleaning, or be cleaned from the ground or from a lower roof level, without the use of an extension ladder, or cleaned by approved suspended scaffolds. Provide two bolts for each single window and each adjacent fixed glass window unit. Locate bolts 44 inches above the window sill.

(B) TYPE AND CONSTRUCTION: Bolts shall be double-head type, constructed of stainless steel and of size and design to comply with the American Standards Association "Safety Code for Window Cleaning" A 39.1-1959. The contact side of bolts shall be ground to fit flat against window jambs. Apply bolts to frames at the factory, or ship loose for field attachment to frames before windows are set. Reinforce backs of frames to receive bolts with (stainless steel)—(galvanized steel) plates welded to frames at factory. Provide special wall anchors on back of frames at points where bolts are located. (The entire installation of cleaner's bolts shall be in accordance with the local building code requirements).

14. INSTALLATION OF WINDOWS:

(A) GENERAL: Windows shall be installed and adjusted by experienced and qualified window erectors and using only skilled window mechanics. Windows shall be installed without forcing into prepared openings, unless detailed or specified otherwise. Installation shall be in accordance with details on project drawings, manufacturer's instructions and the approved shop or setting drawings. Set windows at the proper elevation and location, plumb, level and in alignment; properly brace frames to prevent distortion and mis-alignment. Protect ventilators and operating parts against accumulation of cement, lime and other building materials by keeping ventilators tightly closed. The finished work shall be rigid, neat in appearance and free from defects.

(B) SEALING COMPOUND: All exterior metal to metal joints between members of windows, frames, mullions, and mullion covers shall be set in a sealing compound of type recommended by the window manufacturer. Remove excess compound before it hardens. (Other joints as indicated between windows and sub sills and between ....., shall be filled with sealing compound).

(C) ANCHORS AND FASTENINGS: Anchor window units to masonry, or to other adjoining or adjacent construction as shown on details and approved shop drawings. Where windows are set in prepared masonry openings, place the necessary anchorage during progress of wall construction. Anchors and fastenings shall be built into, anchored, or bolted to the jambs of openings, and shall be fastened securely to the windows or frames, and to the adjoining construction. Unless otherwise detailed, anchors shall be spaced not more than 18 inches apart on heads, jambs and sills. All anchors shall have sufficient strength to hold the member firmly in position.

(D) ADJUSTMENTS AFTER INSTALLATION: After windows have been installed, and glazed, all ventilators and hardware shall be adjusted to operate smoothly and to be weathertight when ventilators are closed and locked. Hardware and moving parts shall be lubricated as necessary. The weather-stripping shall not cause binding of sash or prevent closing and locking of the ventilator; it shall make weathertight contact with frames when ventilators are closed and locked.

15. PROTECTION AND CLEANING:

SEE NOTE 9

(A) PROTECTION: Protect windows, frames and accessories from damage of any kind during handling, transportation and at the job site. Remove any protective tape or coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect windows and frames from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance. Replace any broken glass.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel windows and frames shall have all smears of compounds, tapes and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturer's of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel surfaces is included in another section of the project specification and is not a part of the window contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish Owner with complete instructions for cleaning and maintaining exposed metal surfaces.

CURTAIN WALLS
OR COMPONENTS

Suggested Guide Specifications for

Stainless Steel Curtain Walls or Stainless Steel Components in Curtain Walls

Notes for Specification Writer

GENERAL NOTES

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used for numbering the project specifications, the Stainless Steel Curtain Wall Section should retain its title and be located in the project Specifications as one of the Sections under Division 8, "Doors, Windows and Glass" and be numbered accordingly.

The Metal Curtain Wall Manual published and distributed by the Metal Curtain Wall Division of NAAMM in 1960 is considered by many architects and manufacturers to contain the most complete source of organized technical information available on Metal Curtain Walls; it also represents the best current practice in design principles, fabrication, construction, testing and installation of Metal Curtain Walls.

These Suggested Guide Specifications are prepared in a manner to be used in conjunction with the NAAMM Curtain Wall Manual. In some cases, direct references to various sections of the Manual are made for establishing performance standards and tests. Applicable parts of the Manual and the explanatory text and instructions in connection therewith should be compared with these Suggested Guide Specifications and the Project requirements. Pertinent items should be included as necessary.

The manual is constantly being revised and expanded to keep pace with new materials and methods. Copies of the Metal Curtain Wall Manual, including revisions, may be obtained from:

National Association of Architectural
Metal Manufacturers
228 North LaSalle Street, Chicago 1, Ill.

The text of these Suggested Guide Specifications is prepared and arranged on the basis that the Stainless Steel Curtain Wall Work will be a separate trade section of the project specifications and the work will be performed as a subcontract under a General Contractor. Therefore, all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the text should be modified accordingly.

The design and construction of the curtain wall utilizes a variety of materials which require fabrication and erection by different trades. In order to achieve an overall responsibility for the combined work, it is not advisable to split the curtain wall contract into the various trades. However, in order to conserve space and avoid duplication of specifications, it may be desirable to specify and include items such as windows, stone and precast concrete trim, glass, etc. in the curtain wall section by cross referencing to the appropriate section of the project specifications.

NOTES FOR SPECIFIC ITEMS

NOTE 1: The manuscript herein may be used to specify complete curtain walls of stainless steel, either custom or commercial type; it may also be used to specify stainless steel shapes, windows and other components which form only part of a curtain wall system.

Note that the title of the section as well as the first two sub-paragraphs under "Scope of Work" have been arranged to include the entire curtain wall and also only certain components in a curtain wall system. The title and sub-paragraph 1-(A) that is not applicable should be deleted.

It is intended that sub-paragraph 1-(B) include a brief description of the system and/or the components to be

In some cases, it may be desirable to specify a particular system of a preferred manufacturer in the Base Bid and used, and to list the acceptable manufacturers. When listing acceptable manufacturers, be sure that the manufacturers listed can produce and erect the system as detailed and specified, and they are in approximately the same price and quality range. Generally, custom and standard commercial systems and their manufacturers should not be listed together for the same bid item.

then request Alternate Bids on one or more similar type systems from other manufacturers. This method has many advantages; it will provide ample competition, act as a safeguard against submission of uninvited bids for substitute materials and also permit the Architect or Owner to make the final selection of system and manufacturer based on cost, design, performance and other known factors.

NOTE 2: The finished Curtain Wall Construction requires the coordination and efforts of many different materials, manufacturers, suppliers and sub-contractors. In order to obtain accurate bidding and help prevent later misunderstandings and claims for extra costs, an accurate detailed listing of the "Items Included" and also a listing of "Related Items Included In Other Sections" is of utmost importance and should not be omitted.

NOTE 3: The construction of Mock-Up units for testing purposes or as job samples may or may not be required for each project. Generally this will depend upon the size of the project and the system specified. If Mock-Ups are required, complete information should be given concerning the costs, construction details and the purposes for which they will be used. In some cases existing Mock-Ups which have been previously tested for another project or for commerical production, may serve the purpose.

When testing of a Mock-Up unit is required, the unit should be erected at a testing laboratory or other location where testing equipment of adequate size and type is available. Refer to NAAMM Curtain Wall Manual for information on Mock-Ups.

NOTE 4: The overall performance requirements and tests will vary with the design and geographical location of the building as well as the type of construction and components specified. Only those tests which are necessary to establish compliance with specifications should be included.

Refer to NAAMM Curtain Wall Manual for detailed testing methods and the recommended minimum performance requirements and safety factors.

Field Water Tests are often called for on larger projects for a portion of the Curtain Wall after erection.

Although the NAAMM Curtain Wall Manual does not presently include provisions for conducting Field Water Tests, for projects or systems where Field Water Tests are necessary, the NAAMM Technical Committee may be consulted for their recommended methods and procedures.

When mullions are used to support window cleaning rigs, the side loads on the mullion members created by the rigs should be considered.

NOTE 5: Before including the Guarantee paragraph in a project specification as a part of the Curtain Wall Section, the requirements of this paragraph should be compared with other guarantee requirements that may be included in the General Conditions and/or other parts of the project specifications; omit or revise the guarantee as necessary to avoid conflict or duplication.

NOTE 6: For additional information concerning metals, finishes and other data such as recommended gauges, alloy types, available finishes, finish designations joining methods, methods to eliminate distortion etc., refer to the following publications:

> "Stainless Steel Architectural Fact Sheet." Dated 1964 and prepared by the International Nickel Co., Inc. in cooperation with the Committee of Stainless Steel Producers, AISI.
>
> "Metal Finishes Manual," published 1964 by National Association of Architectural Metal Manufacturers. 228 N. LaSalle St., Chicago 1, Ill.
>
> Books 1 and 2 of the International Nickel Company's "Architect's Stainless Steel Library."

Frequently, windows, mullions panels and other stainless steel items for a single project will be furnished by different manufacturers. Before specifying that the finish for any two items match, a check should be made to determine the feasibility of such a requirement. In some

cases this may increase the cost of the job or present a hardship on one manufacturer; in other cases it may be impossible to match another finish.

NOTE 7: Paragraph 11 "Materials for Glazing in Curtain Walls" and paragraph 22 "Installation of Glass" are included in detail with recommendation that the glass and glazing be a part of the curtain wall sub-contract. However, where the project has a considerable amount of glass in locations other than curtain walls, the detail specifications for glass and glazing in curtain walls could be included under the "Glass and Glazing" Section of the project specification and made a part of the curtain wall section by cross referencing.

NOTE 8: Paragraph 13 "Stainless Steel Windows" are prepared on the basis that windows in curtain walls may be specified under the Window Section of the project specification but included as a part of the Curtain Wall Section by cross referencing. If this is not feasible, then a complete specification for the type of stainless steel windows required in the curtain wall should be inserted in this paragraph. Paragraph 21 "Installation of Windows" should be checked for revision or deletion as necessary. Refer to Note 6 concerning the matching of finishes on Stainless Steel items fabricated by different manufacturers.

A Complete suggested Guide Specification for Stainless Steel Windows is included in this book.

NOTE 9: Paragraph 14 "Panels" is included in outline form only. With the great variety of panel materials available, the utilization of many different methods of panel construction and the variations in type, gauge, texture and finish of metal facings, it would be impractical to include guide specifications describing all the various type panels.

All panels which are a part of the curtain wall, regardless of the material or type, should be included as a part of the Curtain Wall Section. The Specification Writer should insert the proper description for the type of panels selected. In some cases the panels may be included in the Curtain Wall Section by cross referencing to another section of the project specifications. Refer to NAAMM Curtain Wall Manual Specifications, paragraph 4.3, for data on metal faced panels and for performance requirements of other panel types.

NOTE 10: When it is considered necessary to have welded joints in exposed metal work dressed smooth, matching finishes etc., the location of joints so treated should be listed. Dressing and finishing increases costs and may not always be necessary except at eye level. Other acceptable treatments of welded joints should be specified.

NOTE 11: The specific surfaces of stainless steel requiring shop applied protective tape covering should be listed. When protective tape covering is used, it should be removed immediately after the member is installed. This will permit inspection of the surfaces at time of installation and prevent the tape from curing and becoming difficult to remove later. In specific areas of the building where temporary access must be provided through the finished curtain wall during construction, temporary wood covering should be required around the installed members near the access opening.

NOTE 12: The initial cleaning of stainless steel surfaces after erection is specified herein as a part of the Curtain Wall Section. However, the final cleaning is specified to be included under another section of the project specifications. In most localities the final cleaning is considered the responsibility of the General Contractor. In order to avoid later disputes on this part of the Work, a paragraph explaining the detail requirements and responsibility for final cleaning of stainless steel should be included under the "Supplementary General Conditions" or "Special Conditions" Sections of the project specifications.

When cleaning stainless steel surfaces, the recommendations of the manufacturer for each type of finish used should be obtained and followed when possible.

For detailed cleaning information, refer to "Stainless Steel for Maintenance Economy," "Effective Cleaning Methods" as listed in Data Sheet No. 1 (Book No. 2), AISA Data Sheets, Stainless Steel Library series of The International Nickel Company, Inc. Copy available from the Committee of Stainless Steel Producers, 633 Third Avenue, New York 17, N. Y.

Issued: September 1965
Revised: January 1966

Stainless Steel Curtain Walls or Stainless Steel Components in Curtain Walls

SEE NOTE 1

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel curtain walls, and related items necessary to complete the work indicated on drawings and described in specifications.

OR

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel shapes, components and related items indicated in exterior curtain walls and as described in specifications.

(B) GENERAL DESCRIPTION OF SYSTEM: The curtain wall system shall consist of stainless steel members as detailed, with (carbon steel) — (aluminum) auxiliary members and supports where indicated. Spandrel Panels shall be constructed of .....
.....Wall panels shall be constructed of .....
..... Fixed type windows shall have stainless steel frames. Operable windows shall be stainless steel (reversible) — (top-hung) — (projected) — (double-hung) — (horizontal sliding) — (.....
.....) type. The curtain walls shall be (custom type using shapes as indicated) — (commercial type using standard shapes and components as indicated) and as fabricated by any one of the following manufacturers:

(1) .....
(2) .....
(3) .....

SEE NOTE 2

(C) ITEMS INCLUDED: In general, the work to be performed under this section shall include the following items:

(1) Exposed mullions, trim, copings, cover pieces, closures, clips, etc. of stainless steel.
(2) Concealed auxiliary curtain wall members of — (steel) — (aluminum).
(3) Anchors and attachments as required to fasten the curtain wall to the structure — (stainless steel) — (carbon steel) — (aluminum).
(4) Stainless steel frames for fixed glazed panels in curtain walls.
* (5) Frames and sash for ..... type stainless steel windows.
(6) All necessary fastening devices, including items to be embedded in concrete and .....
* (7) Insect screens for window ventilators at locations designated.
* (8) Frames for doors occurring in metal curtain wall.
* (9) Glass and glazing for fixed glazed panels in curtain walls.
(10) Sealing materials and gaskets used in assembling the metal curtain wall and for glazing as required.
*(11) Spandrel and wall panels formed of .....
.....
*(12) Louvers and grilles occurring in metal curtain wall, formed of ..... and including bird screens where indicated.

*(13) Stainless steel flashings for .....
(14) Accessories as specified.
(15) Complete fabrication and erection of all items specified, unless designated otherwise.
(16) Mock-ups as specified.
(17) Performance tests as specified.
(18) Initial cleaning of exposed stainless steel and ..... surfaces.
( ) .....

SEE NOTE 2 (D) RELATED WORK INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specifications:

* (1) Glass and glazing, except as specified.
(2) Caulking, except as specified.
(3) Structural building supports at mullions and .....
(4) Spandrel waterproofing.
* (5) Installation of metal reglets and built-in inserts in masonry and concrete.
* (6) Metal doors and frames in curtain walls.
(7) Store front construction.
* (8) Window washing equipment.
* (9) Final cleaning of stainless steel.
*(10) Protection of finished walls on lower floors while major construction of upper floors is progressing simultaneously.
( ) .....

*(Indicates items that may be included either in this section or in other sections depending upon individual project requirements, and local practice.)

(E) ALTERNATES: Note that alternate No. ..... affects the work required under this section. Refer to Bid Form and to Section ..... for a detailed description of the alternates requested with proposal.

2. COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS:

(A) Any material or operation specified by reference to the published specifications of a manufacturer, The American Society for Testing and Materials (ASTM), The National Association of Architectural Metal Manufacturers (NAAMM), or other published standard, shall comply with the requirements of the current specification or standard listed.

(1) In case of a conflict between the referenced specification and the project specifications, the project specifications shall govern.

(2) The Contractor, if requested, shall furnish affidavit from the manufacturer, certifying that the materials or product delivered to the job meets the requirements specified.

3. SHOP DRAWINGS:

(A) Submit ..... copies of shop and erection drawings of the curtain wall system and accessories to Architect for approval. Submit drawings in accordance with requirements described in Section ..... Obtain approval of drawings prior to proceeding with manufacturing (or with the mock-ups or testing as specified). (The final approval of shop drawings shall be subject to the approval of the mock-up unit and accessories.)

(B) The drawings shall be at one-half scale as far as practical and shall indicate in detail the construction of all parts of the work and including:

(1) Type and gauges of metal and the finish required.
(2) Kinds and thickness of glass.
(3) Type and sizes of glass holding members and type of materials for glazing.
(4) Type and thickness of panels and method of installation.
(5) Methods of joining.
(6) Details of fixed and operable windows.
(7) Provision for expansion and contraction.
(8) Details of all field connections and anchoring; location of soldering and welding.
(9) Fastening and sealing methods.
(10) Details of caulked joints indicating dimensions, type of backing material and type of sealant.
(11) Type, gauge and extent of metal flashings in connection with wall.
(12) Type of drainage and weep system.
(13) Type, thickness and location of insulation.
(14) Accessory items.
( ) .....

4. SAMPLES AND DESCRIPTIVE LITERATURE:

(A) SAMPLES: Submit samples of the items hereinafter listed. Label and submit samples in accordance with requirements as stated in Section No. ..... General Conditions. Submit samples in triplicate unless otherwise specified or directed. Approval must be obtained prior to fabrication or delivery.

(1) Metal samples approximately 6 by 12 inches size of each type and finish specified.
(2) Caulking and sealing compounds and joint backing material.
(3) Gaskets and protective materials.
(4) Sections of panels showing finish and edges.
(5) .....

(B) DESCRIPTIVE LITERATURE: Submit with samples manufacturer's detail specifications, details, available performance test data and instructions for application, cleaning and maintenance.

5. MOCK-UP UNITS:

SEE NOTE 3 (A) The contractor shall construct (at the job site)—(at the plant of the manufacturer)—(at an approved testing laboratory) a full size typical wall unit which

incorporates the horizontal and vertical joints, window units, panels, glazing and other accessories as detailed and specified. The Mock-Up Wall unit size and design shall be as indicated on the project drawings. The Contractor shall submit shop drawings of the Mock-Up for approval. The preparation of Mock-Up Unit shall not begin until tentative approval of shop drawings has been given by the Architect.

6. COORDINATION AND RESPONSIBILITY:

(A) The responsibility for fabricating, testing, coordinating and the erection of all parts of the curtain wall (including the windows, glass and glazing, panels, flashings in the wall and .....) shall be the responsibility of a specialty sub-contractor, unless otherwise approved by the Architect in writing. The responsible sub-contractor must be approved by the Architect.

SEE NOTE 4

7. OVERALL PERFORMANCE REQUIREMENTS AND TESTS:

(A) STRUCTURAL PROPERTIES: The wall shall be designed to withstand the following wind loads normal to the plane of the wall:

Total Wind Pressure: ..... Psf.
Positive Pressure: ..... Psf. (acting inward).
Negative Pressure: ..... Psf. (acting outward).

(1) The deflection of any metal curtain wall member shall not exceed the dimensions recommended and permitted by the NAAMM Metal Curtain Wall Manual.

(2) In addition, members serving as guide rails for movable window cleaning rigs shall be designed to support mid-span concentrated loads of ..... lbs. normal to plane of wall and ..... lbs. applied horizontally, parallel to wall plane. Deflections of members under these loads shall be as specified, except that the maximum deflection parallel to the wall plane shall be .....

(B) PROVISIONS FOR THERMAL MOVEMENT: The contractor shall make adequate provisions for expansion and contraction of the component parts of the curtain wall system and its fastenings to prevent harmful damage caused by buckling, opening of joints, breakage of glass, undue stress on fastenings or other detrimental effects. For design purposes, the provisions for thermal movement shall be based on assumed ambient and surface temperature ranges of ..... degrees F. and ..... degrees F. respectively.

(C) WATER INFILTRATION: No water infiltration shall occur when the wall is tested in accordance with NAAMM "Specifications for Performance Testing of Metal Curtain Walls", (using Test C-1 by static pressure of ..... Psf.) — (using Test C-2 by dynamic pressure). (and including Supplementary procedure). Provision shall be made in the wall construction for adequate drainage to the outside of any water leakage or any condensation that occurs within the outer face of the wall. Drainage and weep openings in wall shall be left open during test.

(D) AIR INFILTRATION: Air infiltration through the wall, when tested in accordance with NAAMM "Specifications for Performance Testing of Metal Curtain Walls", Test B, shall not exceed ..... cu. ft. per minute per sq. ft. of fixed wall area plus ..... cu. ft. per minute per lineal ft. of operable sash perimeter. The weep openings in wall shall be sealed with tape during the test.

(E) DATA ON TESTS AND PERFORMANCE: The Contractor shall furnish satisfactory evidence of the performance requirements specified herein. The evidence shall consist of (test reports of the Mock-Up Units specified) — (a certification of the performance specified based on previous tests for similar type walls). Testing shall be performed by an independent testing agency and the cost of all tests (shall be included as a part of the contract sum) — (shall be handled as an addition to the Contract) — (will be paid by the Owner).

8. GUARANTEE:

SEE NOTE 5

(A) In addition to the guarantee described in the General Conditions and provided by the General Contractor, the Curtain Wall Sub-Contractor (and the Manufacturers of the products used) shall, prior to final payment, guarantee to the Owner in writing that all parts of the work will meet (the performance requirements specified herein) — (the Overall Performance Requirements described in Part 3 of NAAMM Metal Curtain Wall Manual, Current edition) and will be free from defects in materials and workmanship for a period of ..... years from (date of acceptance by the Architect and Owner) — (established completion date).

(1) Colored metal panels and ..... shall be guaranteed against fading for a period of ..... years.

(B) The guarantee shall state that should any defects develop during the guarantee period due to improper workmanship or materials, such defects will, upon written request, be repaired or replaced without cost to the Owner. However, if exploratory work is required to determine the cause of defects, the cost of such work shall be borne by the Contractor if his work is found, in the judgment of the Architect, to be at fault; otherwise the cost of such exploratory work shall be borne by the Owner.

9. METALS AND FINISHES:

SEE NOTE 6

(A) STAINLESS STEEL: Unless designated otherwise, all stainless steel (formed and sheet work) shall conform to ASTM Specification A-167-63, Type 304 or 302, or

Type ..... The gauges of metal required shall be as indicated on drawings and as specified. Bolts, screws and fastenings in finished work shall be stainless steel of finish to match and of alloy type as recommended by the fabricator.

(1) Exposed surfaces of stainless steel shall have finishes to match approved samples for the following finish types and locations:
Use dull cold-rolled unpolished finish No. 2D for .....
Use bright cold-rolled unpolished finish No. 2B for .....
Use polished finish No. 4 for .....
.....
Use brushed satin finish No. 6 for .....
.....
Use special (embossed)—(patterned)—(textured)—(matte)—(proprietary)—(.....) finish similar to ..... for .....
.....

(2) Unexposed surfaces of stainless steel for concealed reinforcing, flashing, ... and other unexposed surfaces shall have finish No. 2B or 2D.

(B) CARBON STEEL: Steel for rolled shapes, plates and bars for general structural purposes, anchors and fastenings shall conform to (ASTM A-36)—(ASTM A-7). Carbon steel sheets shall conform to ASTM A-245 for 18 gauge and heavier and ASTM A-366 for 19 gauge and lighter. Carbon steel members that will be concealed and members in contact with stainless steel shall receive one coat of zinc chromate or other suitable rust resistant paint.

10. MATERIALS FOR SEALING JOINTS:

(A) SEALING COMPOUND: Sealing compound shall be a single component type or two component type at the option of the Contractor, unless specified or noted otherwise. Color of compounds shall be as approved to match or blend with adjacent materials.

(1) Single component sealing compound shall be a synthetic-rubber base, chemically curing and non-sag type complying with Interim Federal Specification TT-S-00230, February 3, 1964.

(2) Two component sealing compound shall be a rubber base type complying with Federal Specifications TT-S-227b, dated October 12, 1964; use Type II (non-sag) for joints in vertical surfaces and Type I (self leveling) for joints in horizontal surfaces.

(B) CERTIFICATION: The Contractor shall furnish (certificates)—(affidavits) from an independent testing laboratory approved by the Architect or from the Sealant Manufacturer attesting that the sealing compounds meet the performance test requirements specified.

(C) SOLVENTS AND PRIMERS: All solvents and primers used in connection with sealing compounds shall be of type proven by tests to be compatible with the compound used and of brands recommended by the manufacturer of the compound. Follow sealant manufacturer's recommendations regarding handling, mixing, surface preparation, priming, application life and application procedure.

(D) BACK-UP MATERIAL: Back-up material for joints to receive sealing compound shall be a closed cell foam such as polyethylene or a closed cell neoprene or butyl rod; it shall be non-staining, and compatible with the sealing compound. The size and shape of the back-up material shall be as indicated by joint details and as recommended by sealant manufacturer for the size of joints and type of adjacent materials. The sealant manufacturer shall furnish satisfactory evidence of compatibility with the back-up prior to delivery.

(E) PREFORMED EXPANSION JOINT FILLER: Preformed expansion joint filler shall be formed to sizes and thickness indicated on drawings. The filler material shall be non-staining and shall not restrict movement of sealant; it must be of type recommended by the manufacturer of the sealant and must be compatible with the sealing compound used. Materials such as resilient foam, sponge, rubber hose or rod stock, or supporting materials such as closed cell rigid foam, cork or non-impregnated fiberboard may be used for filler subject to requirements specified.

(F) PREFORMED SEALING COMPOUND: Preformed sealing compound shall consist of tapes, ribbons, beads or other shapes as required; it shall be a non-skinning (non-resilient)—(resilient and reinforced)—(resilient and non-reinforced) type complying with the applicable Tentative NAAMM Standard Specification (June 1960.) The material shall be formed into sizes, shapes and thickness indicated. Color of compound shall be as selected from manufacturer's stock colors. Preformed (tapes)—(ribbons)—(.....) similar to ..... as manufactured by ..... will be acceptable subject to compliance with requirements specified.

11. MATERIALS FOR GLAZING IN CURTAIN WALLS:

SEE NOTE 7

(A) TYPE AND QUALITY OF GLASS: Glass shall comply with the requirements of Federal Specifications DD-G-451a, as applicable to the type specified. Provide glass of the following types at locations indicated and specified.

(1) CLEAR PLATE GLASS: Glass shall be clear, polished both sides and of (glazing quality)—(..... quality). Use ..... inch thick heavy plate for glazing in ..... Use

..... inch thick regular plate for glazing in .....

(2) TINTED PLATE GLASS: Glass shall be glazing quality, polished both sides, (heat absorbing)—(glare reducing) type and tinted a (gray)—(green)—(bronze) color as manufactured by ..... Use ..... inch thick tinted plate glass for glazing in ....

(3) TEMPERED PLATE GLASS: Glass shall be glazing quality, (clear)—(tinted), polished both sides, similar to "....." as manufactured by ..... Use ..... inch thickness for ..... and ..... inch thickness for other locations where clear tempered plate glass is indicated. Tinted tempered plate glass ..... inch thick and of a ..... color shall be used for glazing in .....

(4) CLEAR SHEET GLASS: Glass shall be similar to "....." as manufactured by .... or "....." as manufactured by ..... Use (double strength)—(heavy sheet ..... inch thickness) and (A)—(B) quality clear sheet glass for all glazing not otherwise indicated or specified. Clear sheet glass shall be cut so the draw or wave distort incurred in the manufacturing process will always run horizontally.

(5) INSULATING GLASS: Glass shall be similar to "..... ....." as manufactured by .... or "....." as manufactured by ..... Units shall consist of an inner pane of ..... inch thick ..... glass and an outer pane of ..... inch thick ..... glass, hermetically sealed at the edges and separated by a ..... inch dehydrated air space. The double glazed units shall be guaranteed not to develop material obstruction of vision as a result of dust or film formation on the inner glass surfaces caused by failure of the seal, other than through glass breakage, within a period of five (5) years from date of installation. Any units failing to comply with the terms of this guarantee shall be replaced without cost to the Owner.

(6) SPANDREL GLASS: Glass shall be .... inch thick, heat strengthened with a non-fading weather resistant ceramic color fused to the back and a ..... finish on the face. Spandrel glass shall be similar to "....." as manufactured by ..... or "....." as manufactured by ..... Color of glass shall be ..... and match the approved samples. Use spandrel glass for panels in curtain walls as indicated and for .....

(B) GLAZING SEALANT: Glazing sealant shall be a single component type, or two component type at the Contractor's option, unless otherwise specified; it shall be used for glazing in metal frames at locations indicated or hereinafter specified. All solvents, cleaning solutions and primers used in connection with the sealant shall be of type proven by tests to be compatible with the sealant used and of brands recommended by the sealant manufacturer. Follow manufacturers recommendations in handling and storing. Glazing sealant that will come in contact with stone, masonry or ..... shall be non-staining. Color of sealant when exposed shall match or blend with the color of adjacent materials.

(1) SINGLE COMPONENT TYPE: Sealing Compound shall be a single component synthetic-rubber base, chemically curing and non-sag type complying with Interim Federal Specifications TT-S-00230, dated February 3, 1964.

(2) TWO COMPONENT TYPE: Sealing compound shall be a two-component rubber base type complying with Federal Specification TT-S-227b, dated October 12, 1964. Use Type II (non-sag type) unless otherwise specified.

(C) GLAZING TAPE: Tape shall be similar to "..... ....." as manufactured by ..... or "....." as manufactured by ....; provide tape of proper thickness and width. Use glazing tape for glazing of .... as hereinafter specified.

(D) GLAZING GASKETS: Gaskets shall be of (neoprene)—(vinyl) or (.....), similar to those manufactured by .... or ..... and comforming to the Tentative NAAMM Specifications, Dated June 1960, for (Rubber-like gasket materials such as Neoprene) or (Plastic gasket materials such as Vinyl). Gaskets shall have moulded corners or butt-pressure contact and be of Durometer hardness as recommended by the manufacturer for the type of gasket used. Provide gaskets of size and shapes indicated. Use gaskets for glazing of ....

(E) SETTING BLOCKS AND SPACER SHIMS: Fabricate blocks and shims from neoprene, lead or ....; shape to the required sizes and thickness. The material used for blocks and spacers must be compatible with the type of compounds and sealants used. The (Shore "A" Durometer) hardness for setting block and shim material shall be (70 to 90 points for setting blocks and 40 to 50 points for spacer shims)—(as recommended by the glass manufacturer).

(F) MANUFACTURER'S LABELS: Labels showing glass manufacturers' identity, type of glass, thickness, and quality will be required on each piece of glass. Labels must remain on glass until it has been set and inspected

by Architect. When glass is not cut to size by the manufacturer, and is furnished unlabeled as "stock to cut," the Contractor shall submit an affidavit, or other satisfactory evidence, stating the quality, thickness, type and manufacturer of the glass furnished. All glazing and sealing compounds shall arrive at the project site in labeled containers which have not been opened.

(G) CERTIFICATION: The Contractor shall furnish (certificates) — (affidavits) — from an independent testing laboratory approved by the Architect or from the Sealant Manufacturer attesting that the compound, sealants and accessories furnished meet the performance requirements specified.

(H) GLASS SIZES: The sizes of glass indicated on drawings are approximate only; determine the actual sizes required by measuring frames to receive the glass at the project site, or from guaranteed dimensions provided by the frame supplier. Dimensions for glass and glass holding surrounds shall be coordinated to provide the following minimum clearances:

(1) At perimeter edge of glass on all four sides, provide clearance equal to glass thickness for single glass and ¼ to 5/16 inch for insulating glass.

(2) The sealer space between face of glass and fixed or applied glazing stops, both indoors and outdoors, shall be not less than 1/16 inch plus glass and sash tolerance, but a minimum of ⅛ inch.

(I) DELIVERY AND STORAGE: Deliver glass to site in suitable containers that will protect glass from the weather and from breakage. Carefully store material as directed in a safe place where breakage can be reduced to a minimum. Deliver sufficient glass to allow for normal breakage.

12. MATERIALS FOR INSULATION (Field Applied):

(A) CELLULAR GLASS INSULATION: Insulation shall be of thickness indicated and conform to Tentative NAAMM Standard Specifications for Cellular Glass Insulation (dated June 1960). Use cellular glass insulation for .....

(B) FIBROUS GLASS BLANKET INSULATION: Insulation shall (be of thickness indicated) — (have a "U" factor of .....) and conform to Tentative NAAMM Standard Specifications for Flexible Fibrous Glass Insulation. Use fibrous glass blanket insulation for .....

(C) FIBROUS GLASS BOARD INSULATION: Insulation shall (be of thickness indicated) — (have a "U" factor of .....) and conform to Tentative NAAMM Standard Specifications for Preformed Fibrous Glass Insulation (dated June 1960). Use preformed fibrous glass insulation board for ....

(D) POLYURETHANE FOAM RIGID INSULATION: Insulation shall (be of thickness indicated) — (have a "U" factor of .....) and be similar to "....." as manufactured by .... or "....." as manufactured by ..... The physical properties of insulation shall be as listed in manufacturers published specifications and literature. Use rigid polyurethane foam insulation for .....

(E) POLYSTYRENE FOAM RIGID INSULATION: Insulation shall (be of thickness indicated) — (have a "U" factor of .....) and be similar to "....." as manufactured by ..... or "....." as manufactured by .... The physical properties of insulation shall be as listed in manufacturers published specifications and literature. Use expanded polystyrene foam insulation for .....

13. STAINLESS STEEL WINDOWS:

SEE NOTE 8

(A) WINDOW TYPES: Stainless steel windows shall be (fixed type) — (operable type — reversible — top hung — projected — double hung — horizontal sliding ....) and of sizes indicated.

(B) SPECIFICATION REQUIREMENTS FOR WINDOWS: Windows to be installed in curtain walls shall comply with all the applicable requirements specified in Section No. ..... of the project specifications for the window types indicated and specified.

OR

(B) SPECIFICATION REQUIREMENTS FOR WINDOWS: Windows to be installed in curtain walls shall be of types indicated and specified and conform to the following requirements:

(1) ....

14. PANELS:

SEE NOTE 9

(A) GENERAL REQUIREMENTS: Panels indicated to be installed in curtain walls shall be included as a part of this section and shall consist of the following types:

(1) Spandrel Panels: Spandrel panels shall be ....

(2) Wall Panels: Wall panels shall be ....

(3) Other Panel Types: ....

(B) FLATNESS FOR METAL PANELS: The exposed panel skin for flat metal panels when installed shall have a visual flatness within the limits specified in NAAMM Curtain Wall Manual based on the type of material used. (Metal panel faces, 20 gauge or thinner shall have integral continuous backing or shall have internal stiffening ribs or breaks spaced to provide the flatness specified).

15. METAL ACCESSORIES:

(A) GENERAL REQUIREMENTS: Metal accessories in connection with curtain walls as indicated on drawings and as listed herein shall be fabricated from stainless steel of types, gauges and finishes specified.

(B) COPING COVERS: Provide stainless steel coping covering at top of curtain walls and elsewhere indicated. Form covers to design shown; use ..... gauge,Type 304 orType 302, orType ..... stainless steel with a No. ..... finish. Provide loose-locked expansion joints in covers at intervals not to exceed 24 feet; fill joints with sealing compound. Secure bottom edges of coping to walls with previously placed concealed cleats of 22 gauge stainless steel spaced approximately 18 inches apart. Where indicated, connect rear edge of coping to base flashings with loose-locked seam; fill seam with sealing compound.

(C) GRAVEL STOPS: Provide stainless steel gravel stops (and fascia) at exposed edges of built-up roof as indicated. Form gravel stops (and fascia) to details shown; use ..... gauge,Type 304 or 302 or Type ..... stainless steel with a No. ..... finish. Extend flange of gravel stop out on top of roofing felts 3½ inches; bed flange in bitumen and secure to wood nailer with flathead stainless steel nails spaced 6 inches apart. Cover flange of gravel stop with two layers of strip roofing felts mopped on. Provide expansion joints as detailed in gravel stops at approximately 24 foot intervals. Gravel stop shall be straight and without waves, dents or buckling.

(D) FLASHINGS: Concealed flashings at spandrels and other locations indicated shall be formed of (32 gauge) —(..... gauge),Type 304 or 302 orType ....., stainless steel with a (standard 2D mill finish)—(..... finish). Concealed flashings shall be formed and installed in a manner to convey any water or condensation within the wall to the outside through weep outlets or other means as indicated.

(1) Exposed flashings, cap flashings and ....shall be formed of (28 gauge)— (..... gauge),Type 304 or 302 orType ..... stainless steel with a (2B mill finish)—(.... finish). Fabricate flashings into convenient lengths. Fold exposed bottom edge back on underside for stiffness. Cap flashing shall overlap base flashings a minimum of ..... inches. Overlap end joints of cap flashing a minimum of 2 inches.

(E) LOUVERS: Fixed metal louvers in curtain walls shall be fabricated of Type 304 or 302 or Type ..... stainless steel with a ..... finish. Construct louver slats and box unit of (22 gauge)—(..... gauge) metal to sizes and shapes indicated. Secure louver slats to frame by (welding)—(riveting). Provide vertical supporting members where indicated, extending from sill to head. Where indicated, construct subframes of ..... steel and anchor into walls to receive louvers. Install a removable type ..... by ..... mesh stainless steel wire screen in metal frame on back side of louvers.

(F) OTHER METAL ACCESSORIES: ....

16. FABRICATION AND WORKMANSHIP:

(A) SHOP ASSEMBLY: Fitting and assembling of component parts shall be performed in the shop insofar as practicable. Work that cannot be permanently shop assembled shall be fitted, assembled, marked and disassembled to assure proper fitting in the field. Shop assembled components shall be marked to correspond with shop drawings for placement location and erection at the project site.

(B) JOINTS IN METAL WORK: Joints between members shall be made by welding or mechanical fastening as indicated or specified. Where welded joints are required, substitution of mechanical fastening will not be permitted. Joints in exposed work shall be carefully matched to produce continuity of line and design. SEE NOTE 10

(1) All weld beads on exposed polished stainless steel surfaces of ..... shall be ground and/or polished to match and blend with finish on adjacent parent metal.

(C) WELDING: All welding shall be performed in accordance with the applicable requirements and recommendation of the American Welding Society (AWS) and using the methods and electrodes as recommended by the manufacturers of the alloys being used. In addition, welds shall be made only by operators who have been previously qualified by tests, as prescribed in the "Standard Qualification Procedure" of the AWS to perform the type of work required.

(D) CLEANING AND PROTECTION: Before leaving the shop, stainless steel surfaces shall have all lubricants used in fabrication removed and be cleaned of other extraneous material. Exposed surfaces of stainless steel used for ..... shall be protected during fabrication, transportation and erection against scratches, splashes of mortar, paint or other defacements. Protection shall consist of covering with a protective tape, paper or other approved coating prior to shipment. Remove protective coverings as soon as possible after erection and prior to field application of joint sealants. SEE NOTE 11

17. PREPARATORY WORK (Prior to Erection):

(A) VERIFYING OF CONDITIONS AND SURFACES: Before starting work, the Curtain Wall Sub-Contractor shall carefully examine all structural elements over which the curtain wall construction is to be applied. He shall examine all adjoining work on which his work is in any way dependent and shall verify all governing dimensions, including floor elevations, floor to floor

heights, minimum clearances between curtain wall and structural frames and other permissible dimensional tolerances in the building frame. Where previously placed dependent work, dimensions or other existing conditions will, in the opinion of the Curtain Wall Sub-Contractor, prevent the satisfactory execution of his work or endanger its permanency, the General Contractor and the Architect shall be notified in writing. The succeeding work shall not proceed until the unsatisfactory conditions have been corrected. The starting of succeeding installation work over a wall area shall imply acceptance of the previously placed work for that area.

(B) STORAGE OF MATERIALS AT SITE: Wall components delivered to the site shall be stored under cover, on wood blocking, or on suitable floors.

(C) BENCH MARKS AND REFERENCE POINTS: The Curtain Wall Sub-Contractor shall see that the required bench marks for elevations, and building line offset marks for alignment, have been established and permanently marked at convenient points. Should any error or discrepancy be discovered in location of the marks, the General Contractor and Architect shall be notified immediately and no further erection work shall be done in that area until the discrepancies have been corrected.

(D) OTHER PREPARATORY WORK: .....
.....

18. INSTALLATION AND WORKMANSHIP

(A) QUALIFICATION OF WORKMEN: The installation and erection of the curtain wall system and all component parts shall be performed by skilled workmen especially trained and experienced in this type of work. The curtain wall manufacturer shall have a qualified representative at the job to direct the various stages of operations.

(B) WORKMANSHIP GENERALLY: The curtain wall members and component parts shall be erected plumb and true in proper alignment and in correct relationship to the work of other trades and the established lines and grades indicated. Maintain the proper tolerances and clearances as indicated on approved shop and erection drawings (and as specified). The drainage and weep system shall be provided as detailed.

(C) ANCHORAGE: Anchorage of the curtain wall to the structure shall be in accordance with details on approved shop and erection drawings. The kind of metal used for anchors and supports shall be as indicated and specified. Supporting brackets shall provide the necessary adjustments to permit accurate location of the wall components. Framing members shall be held securely in vertical and horizontal alignment until permanent fastenings have been made. After the wall is properly positioned, all adjustable anchorage connections shall be (welded)—(bolted) to prevent slippage, unless other positive means are approved by Architect.

(1) Where curtain wall units or components are to be installed within masonry openings, the required built-in anchoring devices shall be set and the curtain wall units installed in the prepared openings.

(D) FIELD PAINTING OF CARBON STEEL: Carbon steel shapes in connection with curtain wall construction that have been shop painted and field welded shall have all field welds and abrasions touched-up with the same type paint as the shop coat.

(1) In addition, the following items of carbon steel shall be painted ..... coats of zinc chromate, red lead or other approved paint:
.....

19. INSTALLING FIELD APPLIED INSULATION:

(A) Insulation indicated as a part of the curtain wall system, but excluding insulation in prefabricated components, shall be of type and quality hereinbefore specified. Insulation shall be field applied as follows:
(1).....

20. INSTALLATION OF PANELS:

(A) Wall panels fabricated of .....
and spandrel panels fabricated of .....
as hereinbefore specified shall be installed in stainless steel frames in accordance with approved shop and setting drawings and the following specific requirements:
(1) .....

21. INSTALLATION OF WINDOWS: SEE NOTE 8

(A) GENERALLY: Windows shall be installed and adjusted by experienced and qualified window erectors and using only skilled window mechanics. Installation shall be in accordance with details on project drawings, manufacturer's instructions and the approved shop or setting drawings. Set windows at the proper elevation and location, plumb, level and in alignment; properly brace frames to prevent distortion and mis-alignment. Protect ventilators and operating parts against accumulation of cement, lime and other building materials by keeping ventilators tightly closed. The finished work shall be rigid, neat in appearance and free from defects.

(B) METAL TO METAL JOINTS: Unless otherwise indicated, metal to metal joints between members of windows, frames, mullions, and mullion covers shall be made watertight with sealing compound, sealing tape or flexible gaskets. (Other joints as indicated between windows and sub sills and between .....
shall be filled with a .....

(C) ANCHORS AND FASTENINGS: Anchor window units to adjoining or adjacent construction as shown on details and approved shop drawings. Anchors and fastenings shall be secured to the window frames, and

to the adjoining construction. Unless otherwise detailed, anchors shall be spaced not more than 18 inches apart on heads, jambs and sills. All anchors shall have sufficient strength to hold the member firmly in position.

(D) ADJUSTMENTS AFTER INSTALLATION: After operable windows have been installed, and glazed, all ventilators and hardware shall be adjusted to operate smoothly and to be weathertight when ventilators are closed and locked. Hardware and moving parts shall be lubricated as necessary. The weatherstripping shall not cause binding of sash or prevent closing and locking of the ventilator; it shall make weathertight contact with frames when ventilators are closed and locked.

SEE NOTE 7

22. INSTALLATION OF GLASS:

(A) STANDARDS: The installation of glass shall be in accordance with (the procedure recommended in the Glazing Manual of the Flat Glass Jobbers Association) —(the Glass Manufacturer's recommendations), except as otherwise indicated on the approved shop and setting drawings or specified herein.

(B) GENERAL REQUIREMENTS AND WORKMANSHIP: Apply glazing compound, glazing sealant, glazing tape and gaskets uniformly with accurately formed corners and bevels. Remove excess compound from glass and sash. Use only recommended thinners, cleaners and solvents. Do not cut or dilute glazing compounds or sealants without approval from Architect. Make good contact with glass and frame when glazing and facing off. Do not apply any compound or sealant at temperatures lower than 40 degrees F., or on a damp, dirty or dusty surface. After glazing, ventilators in sash shall be fixed so they cannot be operated until compound has set. Remove compounds and sealants from patterned glass and other glass having a rough finish before it hardens. Remove any excess sealants from glass and adjoining surfaces during the working time of the material; within 2 to 3 hours.

(1) Where a combination of sealing materials are required for glazing in the same frame, the manufacturer must certify that all the glazing materials furnished are compatible with each other and also compatible with the material used for setting blocks and spacer shims.

(2) Where insulating glass or heat absorbing glass units over 100 united inches in size occur, a void shall be left between the edge of glass and frame at head and jambs. Sills shall be completely filled under edge of glass and as otherwise specified.

(3) Where setting blocks and spacer shims are required to be set into a glazing compound or sealant, they may be buttered with the compound or sealant, placed in position and allowed to firmly set prior to installation of glass.

(4) The manufacturer of the approved glazing tapes, glazing sealants and glazing gaskets shall have a qualified representative present at the start of glazing operations to check installation conditions at the site and instruct applicators on the recommended methods and procedures.

(5) Insulating glass made with heat absorbing glass shall be installed with the heat absorbing pane on the outdoor side.

(6) No attempt shall be made to change the size of heat strengthened, tempered, insulating, colored structural or ceramic colored glass units, after they leave the factory; edges must be clean cut; nipping to remove flares or to reduce oversize dimensions will not be permitted.

(C) INSPECTION OF SASH AND FRAMES: Inspect all sash, frames and surrounds to be glazed under this section and notify the Architect of any defects, improper materials or workmanship, or other conditions that will affect satisfactory installation of glass. Do not proceed with glazing until such conditions have been corrected.

(D) PREPARATION OF GLASS AND RABBETS: Clean the sealing surfaces at perimeter of glass and the sealing surfaces of rabbets and stop beads before applying any glazing compound, tape, sealant or gaskets. Use only the approved solvents and cleaning agents recommended by the compound manufacturer.

(E) POSITIONING GLASS: Center in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centered position of glass in rabbet and provide the required sealer thickness (⅛ inch minimum) on both sides of glass. Whenever glass dimensions are larger than 50 united inches, provide setting blocks at the sill and spacer shims on all four sides; locate setting blocks one quarter way in from each jamb edge of glass. (Setting blocks for 180 degree pivoting sash shall be located as recommended by the sash manufacturer).

(F) SETTING METHODS: The methods for setting glass shall be as indicated on the approved shop and setting drawing and as follows:

(1) Stop bead glazing using glazing sealant shall be used for setting glass in metal frames of .... Apply as follows: ....

(2) Stop bead glazing using glazing tape shall be used for setting glass in metal frames of .... Apply as follows: ....

(3) Stop bead glazing using glazing tape and sealant shall be used for setting glass in metal frames of ..... Apply as follows: ....

(4) Stop bead or channel glazing using flexible gasket channel shaped inserts to provide a compression seal shall be used for setting glass in

metal frames of .....
Apply in accordance with manufacturer's directions using special tools as necessary.

23. APPLICATION OF SEALANTS:

(A) EXTENT: Except where tapes, gaskets or other materials are indicated or specified, sealing compound or preformed sealing tape of type specified shall be used to seal all metal-to-metal joints, all (exterior) joints between metal and masonry or concrete and for all other joints where so indicated.

(B) GENERAL REQUIREMENTS AND WORKMANSHIP: Application of sealing materials shall be performed only by workmen who are experienced and qualified in the application of the materials specified.

(1) The Manufacturer of sealing compounds, tapes and gaskets used shall have a qualified field representative present at the start of sealing operations to check installation conditions at the site and instruct applicators on methods and procedures.

(2) Joints and spaces to be sealed or pointed shall be clean, free from dust and dry. Follow compound manufacturer's recommended procedure for joint preparation. Joint dimensions shall be as indicated on the approved shop and setting drawings with a tolerance of plus or minus ⅛ inch permitted. (Unless otherwise indicated or approved, joints to receive sealing compound shall be a minimum of (¼ inch wide by ¼ inch deep).—(⅜ inch wide by ¾ inch deep.) Compound shall not be applied in temperatures below 40 degrees F. without prior approval of the Architect.

(3) Store and apply compounds and sealants in strict accordance with the manufacturer's directions.

(4) Protective coating on stainless steel and other surfaces that will come in contact with the sealing compound or tape shall be removed before applying sealants or tapes. When solvents are used to remove coatings, they shall be of type that leaves no residue on the metals.

(5) Sealant materials shall not be applied without a backing material or a bond breaker material except as otherwise indicated on shop and setting drawings or approved by the Architect. When using joint backing material of hose or rod stock, it shall be rolled into the joints to avoid lengthwise stretching. Unless otherwise specified or detailed, the backing material shall be kept back a distance of ..... to ..... inch from face of joint to provide the proper depth for sealing compound.

(6) Provide bond breaker material consisting of polyethylene tape or other approved material in joint cavities where indicated, or where sufficient space for back-up material does not exist. Apply material to avoid breaking bond with other surfaces than those indicated. Bond breaker will not be required for joints where back-up material is used.

(7) When recommended by the manufacturer of the sealant used, joint surfaces shall be primed and allowed to dry prior to application of compound or sealant. The primer used must have been tested for staining and durability on actual samples of the joint surfaces to be sealed.

(8) Apply compound with gun having nozzle of proper size and shape for the joint width. Force compound into joints with sufficient pressure to provide solid contact against the backing and to completely fill the joint cavity. Tool the exposed compound to produce the contours shown and a smooth surface. Do not trim edges of compound after joints are tooled. The finished joint shall be of shape and size as indicated, free from wrinkles and watertight.

(9) Use extreme care to prevent the smearing of compounds on finished surfaces adjacent to the joint cavity; remove smears of compound immediately. Use masking tape on one or both sides of the joint cavity where the texture of adjacent material will be difficult to clean; remove tape immediately after joint has been filled and tooled.

24. PROTECTION AND CLEANING:

SEE NOTE 12

(A) PROTECTION: Protect curtain walls, windows, frames and accessories from damage of any kind during handling, transportation and at the job site. Remove protective tape or coatings as soon as possible after erection. After installation and until acceptance of the work under this section, protect curtain walls and components from damage during subsequent construction activities. Damaged metal shall be satisfactorily refinished or replaced prior to acceptance.

(B) INITIAL CLEANING: The exposed surfaces of stainless steel and .....
shall have all smears of compounds, tapes, sealants and other unsightly marks removed as the work progresses and exposed surfaces left clean. The methods and solvents used for initial cleaning shall be as recommended by the manufacturers of the materials involved.

(C) FINAL CLEANING: Final cleaning of exposed stainless steel and other metal surfaces is included in another section of the project specification and is not a part of the curtain wall contract.

(D) MAINTENANCE INSTRUCTIONS: Furnish owner with complete maintenance instructions for cleaning and maintaining exposed metal finishes.

Suggested Guide Specifications for

Stainless Steel Roofing, Flashing and Accessories

Notes for Specification Writer

GENERAL NOTES

The Foreword in front of book describes the Format and Arrangement, Intent, Notice of Responsibility and Suggestions for using these Guide Specifications.

When the C.S.I. Format and Indexing System is used as the basis for numbering the project specification, the Metal Roofing, Flashings and Accessories described herein would normally be located as one of the sections under Division 7—"Moisture Protection."

References are made herein to the following manuals:

The Architectural Sheet Metal Manual First Edition, published in 1965 by the Sheet Metal and Air Conditioning Contractors National Association, Inc., 107 Center Street, Elgin, Illinois. (Referenced as "The SMACNA Manual.")

The Stainless Steel Data Manual — Suggested Practices for Roofing, Flashing, Copings, Gravel Stops, Fascia and Drainage as published by The Committee of Stainless Steel Producers, AISI, 150 East 42nd Street, New York, N.Y. 10017 and dated August 1966.

In some cases, references are made to specific plate and/or detail numbers. In other cases, blanks are provided for the user to select plates and details that are applicable to the job.

The text of these Suggested Guide Specifications is prepared and arranged on the basis that the Stainless Steel Roofing, Flashings and Accessories will be a separate trade section of the project specification and the work will be performed as a sub-contract under a General Contractor. Therefore all bids, shop drawings, samples, etc. will be submitted through the General Contractor. For projects where a General Contractor is not engaged, the text should be modified accordingly.

Paragraphs 1 through 9 are generally applicable to the entire section. Paragraphs 10 through 36 describe only specific items; however they are dependent to some extent upon the requirements of paragraphs 1 through 9. When only a few specific items from these guide specifications are used to form parts of another specification section such as Built-Up Roofing, Slate Roofing, etc., care should be taken to include the applicable requirements described herein in paragraphs 1 through 9.

These Guide Specifications are prepared to supplement details on the project drawings as necessary. Certain requirements which are adequately covered by large scale details on the project drawings may be deleted from the

specifications. In some cases the user may conserve on drafting and specifications by referencing the plate and detail numbers provided in The SMACNA Manual or by direct reference to the Stainless Steel Data Manual.

The words, figures or clauses in (parenthesis) indicate a choice that must be made. Inapplicable words, figures and clauses should be omitted or revised to suit the project requirements. The blank spaces must be filled in to complete the information necessary. The paragraph and page numbering system indicated may be changed to suit individual requirements.

The system and text presented herein, for these Suggested Guide Specifications require that the user fill in the blank spaces, make the changes, additions or deletions necessary to adapt them to his specific project conditions and requirements. The user must assume full responsibility for correctness of the finished specifications. No warranty expressed or implied, is made and no responsibility is assumed by the Author, the International Nickel Company, Inc. or the American Iron and Steel Institute with respect to the use of these Suggested Guide Specifications.

These Suggested Guide Specifications shall not be made a part of any specification or contract by reference.

NOTES FOR SPECIFIC ITEMS

NOTE 1: This suggested paragraph is included for the specification writers who make a practice of listing the items to be provided under each trade section. Such a list is often helpful to contractors and subcontractors during the bidding period, especially when the divisions of work become complicated. When included, the list should be complete. If the project drawings clearly indicate the extent and location of all items to be included under this section, the entire paragraph could be omitted.

NOTE 2: Stainless steel AISI Types 302 or 304 are generally recommended for normal flashings and roofing work. For most roofing and flashing applications, "dead soft fully annealed" material is recommended and should be specified. Where stainless steel is used in locations requiring maximum resistance to corrosion, specify Type 316. AISI No. 2D, dull finish is preferred for most roofing and flashing installations, particularly where a non-reflective effect is desired. Where a bright polished finish is desired, specify a No. 4 finish. Other finishes are also available.

For additional information concerning metals, finishes and other data such as recommended gauges, alloy types, available finishes, finish designations, joining methods, methods to reduce distortion and waviness, refer to the following publications.

"Stainless Steel Data Manual, Suggested Practices for Roofing, Flashing, Copings, Gravel Stops, Fascias and Drainage" as published by The Committee of Stainless Steel Producers, American Iron and Steel Institute and dated August 1966.

"Stainless Steel Architectural Fact Sheet," dated 1964 as prepared by the International Nickel Co., Inc. in cooperation with The Committee of Stainless Steel Producers, AISI.

"Metal Finishes Manual," published 1964 by National Association of Architectural Metal Manufacturers, 228 N. LaSalle St., Chicago, Ill.

In most cases, the minimum gauges and metal thickness listed herein for specific items are in accordance with suggestions of the AISI Committee of Stainless Steel Producers and accepted industry practices. Heavier gauges may be required for special conditions.

NOTE 3: Solder should be used only as a means of filling or sealing joints; it should never be relied upon to provide structural strength. Where strength is required, joints should be fastened mechanically or welded.

NOTE 4: When it is considered necessary to have welded joints in exposed metal work dressed smooth, the location of joints so treated should be specified. Dressing and finishing increases costs and is generally not necessary in sheet metal work except at eye level locations.

NOTE 5: Where the Diamond Pattern is used for flat seam roofs, change in the size of sheet Guide Specification to 15 by 15 or 18 by 18 inches, and revise cleating requirements accordingly.

Where flat seam roofs occur on surfaces having a slope of 3 inches per foot or more and with adequate drainage, seams may be sealed with white lead paste or an approved sealing compound in place of the solder specified.

On very steep roofs such as spires and other roofs having slopes 6 inches per foot or more, sealing of joints may not be necessary, but a ¾ inch edge fold should be specified.

NOTE 6: Paragraph 14 (E) should be included as part of flat seam roof specifications only when expansion joints or expansion battens are used to divide large roof areas. When expansion joints are required, they should be located and detailed.

The use of expansion joints to break up large areas of low pitched flat seam metal roofs is recommended by some manufacturers to prevent buckling of roofing sheets and the loosening of seams and cleats. There are other manufacturers who do not recommend the use of expansion joints. Recommendations of the manufacturer should be obtained and all conditions considered for each project.

NOTE 7: Standing seam roofs are intended for application on slopes of 3 inches per foot or greater. Make provision for installation of wood nailing strips to receive cleats where deck material is not wood. The width of roofing sheets should be specified; note that metal thickness increases with the sheet width. Long pans up to 60 feet may be used and are usually formed at the site with portable rolled pan forming equipment. (See Stainless Steel Data Manual for details.)

A proprietary welded type standing seam roofing system utilizing long pans formed at the site and portable welding machines may be used in place of the methods specified. If this system is used, consult manufacturers literature and revise the specification accordingly. See that sufficient electric service is available to operate the welding machines.

NOTE 8: Batten seam roofing is intended for application on slopes of 3 inches per foot and greater; however, some manufacturers recommend batten seam roofs on slopes as low as 1½ inches per foot where mechanical type metal battens are used. Make provision for installing wood nailing strips to receive cleats where deck material is not wood. Care should be taken in spacing the battens to avoid waste from cutting the metal sheets. If a stock metal batten system is used, consult manufacturers details and revise this specification accordingly.

NOTE 9: Metal base flashing is not generally recommended for built-up roof installations. It should be used, with built-up roofs only where base flashings are not suitable. Adequate wood nailers must be provided for securing base flashing to decks.

NOTE 10: When reflective finishes such as AISI No. 4 are used for gravel stops and fascias, care should be taken to control visual waviness. This is especially necessary at eye level locations and for wide fascias. Visual waviness may be reduced by increasing the metal thickness or by detailing ribbed, cross corrugated or curved profiles. Matte, textured or patterned finishes may not require special detailing. (Refer to the "Stainless Steel Data Manual" for suggestions concerning flatness.)

NOTE 11: The gauge or thickness of metal for gutters should be determined by the type and size of gutters. Refer to Plate 1 Chart 6 of SMACNA Manual for recommended gauges based on girth of gutter. Also refer to Chart 7 on Plate 3 for recommended distance between expansion joints for built-in gutters.

NOTE 12: Where adjustable metal louvers, self closing fire louvers or other special type louvers are required, revise the specifications accordingly. Louvers requiring duct connections should be provided with collar extensions unless this requirement is included as part of the duct work.

Issued: September 1966

Stainless Steel Roofing, Flashings and Accessories

1. SCOPE OF WORK:

(A) EXTENT: The work required under this section shall consist of furnishing and installing all stainless steel roofing, flashings, accessories and related items necessary to complete the work indicated on drawings and described in specifications.

SEE NOTE 1

(B) ITEMS INCLUDED: In general the work to be performed under this section shall include the following items:

(1) .....
(2) .....
( ) .....

(C) RELATED ITEMS INCLUDED IN OTHER SECTIONS: The following items of related work are included in other sections of the project specification:

(1) Roof drains, inside conductors and leaders.
(2) Flashing around pipes, ducts and other mechanical and electrical work that passes through roofs or exterior walls.
(3) Wood blocking and nailers for fastening sheet metal flashings, gravel stops and similar items.
(4) Adjustable type louvers.
(5) Sheet metal work in connection with heating and ventilating systems.
(6) Caulking, except as specified herein.
(7) Installation of metal reglets and .....
(8) Insulation and vapor barriers under metal roofs.
( ) .....

(D) ALTERNATES: Note that alternate No. ..... affects the work required under this section. Refer to Bid Form and to Section ..... for a detailed description of the alternates required.

2. COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS:

(A) Any material or operation specified by reference to the published specification or standard of a manufacturer, trade association, technical organization or other published standard, shall comply with the requirements of the current specification or standard listed and include all additions and amendments in effect on the date of invitation for bids.

(1) In case of conflict between the referenced specification or standard and the project specification, the project specification shall govern.
(2) The contractor, when directed, shall furnish an affidavit from the manufacturer, certifying that the materials or products delivered to the job comply with the requirements specified.

3. SHOP DRAWINGS:

(A) Submit ..... copies of shop drawings for sheet metal work to Architect for approval. Submit drawings in accordance with requirements described in Section entitled "(General Conditions) — (.....)." Obtain approval of drawings prior to proceeding with fabrication. Shop drawings shall indicate thickness and dimensions of all parts, fastening and anchoring methods, details and locations of all seams, joints and other provisions necessary for thermal expansion and contraction.

4. SAMPLES:

(A) Submit samples in duplicate of the items hereinafter listed. Label and submit samples in accordance with requirements described in Section entitled "(General Conditions) — (.....)." Approval must be obtained prior to fabrication or delivery.

(1) Metal samples approximately 6 by 12 inches of each finish and on each kind of sheet metal specified.
(2) Fasteners, each type.
(3) .....

5. SHEET METAL MATERIALS, FINISHES AND ACCESSORIES:

SEE NOTE 2

(A) STAINLESS STEEL SHEETS OR STRIPS: Stainless steel sheets shall conform to ASTM Specification A 167, Type 302 or 304 unless other Types are specified. Use finish 2D for concealed and exposed flashings, metal roofing and .....; use (No. 2B) — (No. 4) — (matte) — (ribbed) — (cross corrugated) — (textured) finish at locations designated for specific items. The thickness and gauges of stainless steel shall be as indicated on drawings or as hereinafter specified for each item.

(B) STAINLESS STEEL WIRE: Wire shall conform to ASTM Specification A 478, Type 302 or 304 and of gauge indicated or specified.

(C) SOLDER: Solder shall conform to ASTM Specification B 32, (50-50 percent) — (60-40 percent) — (80-20 percent) block tin and pig lead.

(D) FLUX: For tinning stainless steel surfaces, use acid type flux designed especially for use in soldering stainless steel. For pre-tinned surfaces, use regular rosin type flux.

(E) SEALING COMPOUND: Sealing compound shall be a single component synthetic-rubber base type complying with Federal Specification TT-S-00230 or a two component type complying with Federal Specification TT-S-2276b. Color of compound shall be as approved to match or blend with adjacent materials.

6. GENERAL REQUIREMENTS:

(A) SCHEDULING AND COORDINATING WORK: Schedule and coordinate sheet metal installations with the work of other trades where it is integral or contiguous therewith. Materials furnished under this section which are to be built-in by other trades shall be delivered to the site in sufficient time to avoid delays to construction progress. Instruct other trades concerning the location and placement of reglets, wood nailers and cleats.

(B) PROPER SURFACES: Surfaces to which roofing and sheet metal are to be applied shall be even, smooth, sound, thoroughly clean and dry and free from projecting nail heads or other defects that would affect the application. Report in writing any unsatisfactory surfaces to Architect.

(C) DISSIMILAR METALS: Where stainless steel abuts or members into adjacent dissimilar metals, the juncture shall be executed in a manner that will facilitate drainage and thus minimize the possibility of galvanic action.

(D) ACCESSORIES: All accessories or other items essential to the completeness of the sheet-metal installation, though not specifically shown or specified, shall be provided. All such items, unless otherwise indicated on drawings or specified, shall be of the same kind of material as the item to which applied and the gauges shall conform to recognized industry standards of sheet metal practice.

(E) PROVISIONS FOR EXPANSION AND CONTRACTION: Provide expansion joints in sheet metal work at intervals as indicated or specified. Expansion joints shall be fabricated in accordance (with details on project drawings)—(with applicable details as indicated in the SMACNA Manual).

(F) WORKMANSHIP: Fabricate and install sheet metal with lines, arrises and angles sharp and true, and plane surfaces free from objectional wave, warp or buckle. Exposed edges of sheet metal shall be folded back to form a ½ inch wide hem on the side concealed from view. Finished work shall be free from water leakage under all weather conditions. The workmanship and methods employed for forming, anchoring, cleating and the expansion and contraction of sheet metal work shall conform to applicable details and description as indicated in current edition of the following publications unless other methods are indicated on project drawings or specified herein.

(1) Stainless Steel Data Manual — Suggested Practices For Roofing, Flashing, Copings, Gravel Stops, Fascia and Drainage as published by the Committee of Stainless Steel Producers AISI, August, 1966 and hereinafter referred to as "The Stainless Steel Data Manual."

(2) Architectural Sheet Metal Manual as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. and hereinafter referred to as "The SMACNA Manual."

7. SOLDERING:

(A) Except where other methods of jointing are indicated or specified, all joints, seams and connections of sheet metal work shall be soldered as follows: SEE NOTE 3

(1) Remove grease and dirt from metal surfaces; use clean rag soaked in solvent. Smooth surfaces to be soldered shall be roughened with clean emery cloth or sandpaper (not steel wool). Apply acid-type flux and pre-tin all surfaces to be joined.

(2) Remove all flux residue by scrubbing, neutralizing with ammonia or a 5-10% solution of washing soda and followed by a clear-water rinse.

(3) Assemble parts and solder using regular non-corrosive rosin flux. Heat metal thoroughly to completely sweat solder through full contact area.

8. WELDING:

(A) Welding may be used in lieu of soldering for sheet metal shop fabrication and for field fabrication of . . . . . Weld other joints, seams and connections at locations indicated on drawings or as hereinafter specified.

(B) In exposed locations such as . . . . . , dress weld beads smooth and finish to match and blend with adjacent parent metal. SEE NOTE 4

9. FASTENINGS:

(A) Unless other materials are indicated or specified, all nails, screws, bolts, rivets and other fastenings for sheet metal shall be Type 302, 304 or 305 stainless steel and of size and type suitable for the intended use. Unless otherwise indicated or specified, all fastenings shall be concealed; all nails shall be 12 gauge, flat head annular-thread type, and of sufficient length to penetrate backing at least ¾ inch. Space nails on 6 inch centers unless other spacing is designated.

10. CLEATING:

(A) Generally cleats shall be 2 inches wide by 3 inches long and formed of stainless steel of the same thickness as the member being fastened. Secure cleats to wood deck or to nailing strips with 2 nails spaced ¾ inch from the end; turn end of cleat back to cover nail heads. Lock other end of cleat into seam or the folded edge of member being fastened. Where seams are to be soldered, roughen and tin the cleats. Use cleats for securing edges of sheet metal members over 12 inches wide and other locations indicated or specified. Space cleats not more than 12 inches apart unless other spacings are indicated or specified.

11. CONTINUOUS EDGE STRIPS:

(A) Provide continuous edge strips at eaves, gables and ..... for attaching exposed terminating edge of gravel stops, fascia-gravel stops and metal roofing. Fabricate edge strips from (.025 inch)—(a double thickness of .015 inch) stainless steel in lengths of 8 or 10 feet. Edge strips shall be (1¼ inches)—(....inches) wide. Set edge strips straight and true and secure in place with stainless steel (nails)—(screws) of proper size and spaced not more than 6 inches apart.

12. REGLETS:

(A) Provide watertight reglets in masonry and concrete to receive cap flashings and ..... at locations indicated. Form reglets of stainless steel not less than .012 inches thick.

(B) In masonry, use open type reglets having suitable means for anchoring into mortar joints and with flashing receiver slots at least 1 inch deep by $\frac{3}{16}$ inch wide. Insert cap flashing and ..... into receiver slot full depth and lock in place.

(C) In concrete, use open type reglets having flashing receiver slot at least 1 inch deep by $\frac{3}{16}$ inch wide and sloped upward at 45 degrees. Fasten to concrete forms with double head galvanized steel nails spaced 12-inches apart.

(D) Insert cap flashing and ..... to full slot depth; wedge metal in place with lead-strips spaced on 12 inch centers or with lead caulking rope. When wedges are used, caulk reglet with (an approved weather-resistant fibrous compond)—(sealing compound hereinbefore specified).

(E) Where cap flashing in connection with reglets is designed to have a special snap-lock feature, the reglets shall be a factory prefabricated product designed with suitable anchorage features to hold the flashing in place.

13. FELT UNDER STAINLESS STEEL ROOFS:

(A) Cover roof decks under metal roofs with a layer of 15 lb. asphalt or coal-tar saturated felt; lap joints 3 inches. Turn felt up 6 inches on abutting vertical surfaces; double felt in valleys, over hips and at ridges. Nail felt to sheathing at 6 inch centers on all laps and edges; use large head hot-dipped galvanized nails, (except use special gypsum staples for nailing into gypsum roof decks). Apply a layer of rosin-sized building paper over felt to prevent bonding between the metal and felt.

14. STAINLESS STEEL ROOFS — FLAT SEAM PAN-TYPE:

(A) Cover roof surfaces of ..... with (.015 inch)—(....inch) thick stainless steel (Type 302 or 304)—(Type....), (2D finish)—(.... finish), dead soft fully annealed. Lay roof with flat seams and in rectangular pattern. SEE NOTE 5

(B) Apply felt and building paper over deck as hereinbefore specified. Lay sheets of roofing metal, not larger than (15 by 20 inches)—(16 by 18 inches)—(18 by 24 inches)—(20 by 28 inches) with long dimension parallel with eaves and the cross joints staggered. For joints that require soldering, sheets shall be pre-tinned 1½ inches back from all edges and on both sides of sheet.

(C) Form sheets into pans so that two adjacent edges of each sheet are folded over the upper surface ½ inch, and the other two edges folded under ½ inch. Secure metal pans to deck with stainless steel cleats as hereinbefore specified; use a minimum of four cleats for each sheet; space cleats along each edge at mid points of sheet. Fold edge of sheets and cleats together, carefully flatten seams and fill with (solder)—(compound).

(D) Where metal roofs abut walls or other vertical surfaces, the roofing pans shall be locked and soldered to the cleated base flashings. Extend metal base flashings up on vertical surfaces at least .....inches and terminate as indicated. Where metal roofs abut slate or other shingle type roofs, extend roofing under the .... roofs at least .....inches and secure to deck with cleats. Terminate metal roofing along eave and rake edges by bending the metal up 1 inch at an angle to retain drainage water and then turning it down and hooking the lower end over a previously-installed continuous edge strip. Edge strips shall be as hereinbefore specified.

(E) Where a flat seam roof with soldered seams exceeds (1500)—(....) sq. ft. in area or exceeds (40 feet)—(....feet) in any direction, expansion joints or battens shall be provided to divide the roof into sections (as indicated on drawings)—(approximately 36 feet square). Form expansion joints or battens (as detailed on project drawings)—(as indicated in The SMACNA Manual, Plate No. ....., Detail No. .....). SEE NOTE 6

15. STAINLESS STEEL ROOFS — STANDING SEAM TYPE:

(A) Cover roof surfaces of ..... with stainless steel sheets (Type 302 or 304)—(Type.....), SEE NOTE 7

(2D Finish)—(. . . . . finish) dead soft fully annealed. Roofing sheets shall be (18 inches)—(24 inches) wide and in lengths of 8 or 10 feet. The minimum metal thickness shall be (.015 inch when 18 inch wide sheets are used)—(.018 inch when 24 inch wide sheets are used). Install roofing with standing seams using either the roll or pan method. When roll method is used, lengths of sheets may be increased to . . . . . feet.

(B) Apply felt and building paper over deck as hereinbefore specified. Lay sheets of roofing with long dimension following the roof slope. Double-lock the sheets together to form a strip the full length of roof slope. Stagger cross seams in adjacent strips; do not solder cross seams. Secure metal roofing to decking or to wood nailing strips with stainless steel cleats as hereinbefore specified; space cleats 12 inches on center along each standing seam.

(C) Space seams accurately (to layouts indicated)—(. . . . . inches on centers) and finish them ⅞ to 1 inch high, except on curved roofs where they shall finish ½ inch high. Make locked portion of finished standing seams 5 plies thick. Finished seams shall be straight and of uniform height. Form ridges and hips (with standing seams as specified for main roof)—(to details shown on project drawings)—(as indicated in The SMACNA Manual, Plate No. . . . . , Detail No. . . . .).

(D) Form valleys of separate strips not more than 10 feet long. Lap joints 6 inches. Extend valley sheets under roofing sheets 6 inches on each side and fasten with cleats spaced not more than 18 inches on centers. At valley line, fold and lock roofing sheets to valley cleats.

(E) At eaves without connecting gutters or connecting flashings, hook ends of roofing sheets over a previously-installed continuous edge strip as indicated and specified. At eaves where connection of roofing to gutters or flashings is required, make connections with loose lock and unsoldered joints (as detailed)—(as indicated on Plate No. . . . . , Detail No. . . . . in The SMACNA Manual).

(F) At gable and rake edges, terminate metal roofing (by turning edges of sheets up to form a standing seam and extend lower end down and hook over a previously installed continuous edge strip)—(as detailed on project drawings)—(as indicated on Plate No. 87, Detail No. . . . . in The SMACNA Manual).

(G) Where metal roofs abut walls or other vertical surfaces; the roofing sheets shall form a loose-locked joint near the wall line with the cleated base flashings. Extend metal base flashings up on vertical surfaces at least . . . . . inches and terminate as indicated.

(H) Where metal roofs abut slate or other shingle type roofs, extend roofing under the . . . . . roofs at least . . . . . inches and secure to deck with cleats.

16. STAINLESS STEEL ROOFS — BATTEN SEAM TYPE:

SEE NOTE 8

(A) Cover roof surfaces of . . . . . with stainless steel sheets laid with batten seams spaced as indicated. Roofing sheets shall be (Type 302 or 304)—(Type . . . . .)—(2D finish)—(. . . . . finish), dead soft fully annealed, (18 inches)—(24 inches)—(30 inches) wide and in lengths of 8, 10 or . . . . . feet. The minimum metal thickness shall be (.015 inch for 18 inch wide sheets)—(.018 inch for 24 inch wide sheets)—(.021 inch for 30 inch wide sheets).

(B) Apply felt and building paper over deck as hereinbefore specified. Install treated and tapered wood battens (or rolled formed stainless steel battens) of size, shape and spacing as indicated. Secure battens to wood deck with stainless steel nails of proper size and with heads driven flush with batten surface. For decks other than wood, secure battens to flush wood inserts with nails or direct to deck with countersunk flat head bolts.

C) Form roofing pans and batten cover strips by brake-forming sheets (to design indicated on project drawings)—(to design indicated in The Stainless Steel Data Manual)—(to design indicated on Detail No. . . . . , Plate No. 88 in The SMACNA Manual). Lay starting pans at eaves in alternate half and full lengths, thus staggering the transverse seams. Fasten pans together at cross seams and secure to deck with 2 inch wide cleats; place one cleat at center of each cross seam and space cleats 16-inches apart along each side of battens.

(D) Cleats shall extend across underside of batten, be nailed to bottom of batten strip and turned up on each side to engage the roofing sheets. At contractor's option, cleats may be fastened to the side of batten strips, or split cleats may be used and fastened to the top and side of batten strips.

(E) On roofs with a slope of 6 inches or more per foot, form cross joints with loose-lock unsoldered seams as indicated by Detail 4-F or C; Plate 89 of The SMACNA Manual. On roofs with a slope of less than 6 inches per foot, form cross seams with upper ends of lower pans secured to deck by hooking to cleats and lower ends of top pans secured by hooking over a 1¾ inch wide lock strip which is soldered or welded to the lower pan; all as indicated by Detail 4-A, Plate 89 of The SMACNA Manual. (Fill all cross seams with white lead paste or an approved compound or sealant).

(F) Place cover strips over battens, fold edges under horizontal flanges of adjacent roof pans and flatten down against sides of wood battens. Where formed stainless steel battens are used, bed cover strips in sealing compound as hereinbefore specified and secure to batten with stainless steel screws, clips and neoprene washers (as

detailed on project drawings)—(as indicated in The Stainless Steel Data Manual)—(in accordance with manufacturer's recommendations). Cover batten ends with a cap folded and locked into cover strips and to the vertical sides of pans. Cover battens at ridges and hips similar to battens on main roof (refer to Detail 5, Plate 89 of The SMACNA Manual). Battens flush with gable or rake ends shall have the metal cover extended down and hooked to a previously placed continuous edge strip, (refer to Detail 6, Plate 90 of the SMACNA Manual).

(G) Form valley sheets in lengths not more than 10 feet and lay each sheet to lap over lower sheet at least 6 inches. Extend valley sheets under roofing sheets at least 6 inches on both sides; fold edges ½ inch and cleat at 16 inches on center. At valley line adjacent to lower edge of roofing sheets, provide a ¾ inch double fold in the valley sheets to engage a ¾ inch single fold in the roofing sheets. Notch lower end of wood battens to permit folded edge of valley sheet to pass under the battens; (refer to Detail 7, Plate 90 of The SMACNA Manual).

(H) At eaves without built-in or rectangular type gutters, hook each pan over a previously placed continuous edge strip; extend edge strip up on roof deck under roofing at least 4 inches and nail on 6 inch centers. At eaves where built-in or rectangular type gutters occur, connect roofing pans to gutters as indicated and specified.

(I) Where metal roofs abut walls or other vertical surfaces, the roofing sheets shall form a loose-locked joint near the wall line with the cleated base flashings. Extend metal base flashings up on vertical surfaces at least ..... inches and terminate as indicated.

17. STAINLESS STEEL BASE FLASHING:

SEE NOTE 9

(A) Provide stainless steel base flashings where built-up and ..... type roofs abut vertical surfaces without a cant strip and at other locations indicated on drawings. Fabricate base flashings from (0.15 inch)—(..... inch) thick stainless steel, (Type 302 or 304)—(Type .....)—(2D finish)—(..... finish) dead soft fully annealed.

(B) Where metal base flashing is used in connection with built-up roofs, extend flashing not less than 4 inches out on the roof and at least ..... inches up on vertical surfaces; terminate base flashing 4 inches under metal cap flashing or lock into back edge of metal wall coping, or to other work as detailed. (Fold outside edge of horizontal leg ½ inch and fasten with cleats 12 inches on center)—(Nail outside edge of horizontal leg 6 inches on center). Provide loose-locked joints not more than 8 feet from external and internal corners and in straight runs at not over 24 foot intervals; fill joints with plastic cement or sealing compound. Other joints in flashings shall be locked or lapped and soldered.

(C) On sloping slate and other shingle type roofs, build in base flashing with each course of roofing material. Lap each piece of flashing over underlying flashing at least 4 inches and extend it up under the cap flashing not less than 4 inches.

18. STAINLESS STEEL CAP FLASHING:

(A) Provide metal cap flashing at top edges of metal base flashings and at other locations indicated on drawings. Fabricate cap flashings from (.015 inch)—(..... inch) thick stainless steel, (Type 302 or 304)—(Type .....)—(2D finish)—(..... finish), dead soft fully annealed.

(B) Form flashing in 8 or 10 foot lengths, except where shorter pieces are required; lap end joints a minimum of 3 inches; do not solder or weld joints. Stagger cap flashing joints with relation to base flashing joints. Make flashing continuous at angles. Cap flashing shall overlap base flashing a minimum of 4 inches, except where it shall be concealed or is otherwise indicated. Bottom edge of cap flashing shall be folded back ½ inch on underside.

(C) Extend cap flashing into masonry and ..... walls not less than (1½ inches)—(..... inches). Where cap flashing terminates in raked joints or reglets, fasten flashing with lead wedges every 12 inches. Fill reglets on horizontal surfaces continuously with molten lead (or sealing compound). Fill reglets on vertical surfaces with sealing compound. Sealing compound shall be synthetic rubber type as hereinbefore specified.

(D) Where pre-fabricated cap flashing and reglet system is used, the upper edge of cap flashing shall be formed with an approved snap-lock flange to engage the reglet receiver and to provide a spring action at bottom edge against the base flashing.

(E) Where sloping shingle type roofs abut vertical surfaces, install continuous step flashings of separate pieces woven in with each course of shingles. Install each step to overlap underlying step by 4 inches; do not solder or weld joints.

19. FLASHING VALLEYS IN SHINGLE TYPE ROOFS:

(A) TYPE OF VALLEYS: Form valleys for (slate)—(tile)—(concrete)—(cement asbestos) shingle type roofs open or closed type as noted on drawings. Use stainless steel (Type 302 or 304)—(Type .....)—(2D finish)—(..... finish), dead soft fully annealed, and of thickness indicated or specified.

(B) OPEN TYPE: Open valleys shall be (8 inches)—(..... inches) wide between the shingles for the entire length. Flash valleys with (0.15 inch)—(..... inch) thick, stainless steel sheets in lengths of 10 feet maximum and with ends lapped 6 inches. Extend metal

flashing under shingles at least 6 inches on each side of valley. Fold long edges of flashing for cleating; provide cleats of the same metal used for flashing; hook cleats into folded edges and space cleats 24 inches on centers. Nail cleats to the roof sheathing or wood nailing strips.

(C) CLOSED TYPE: Flash closed valleys underneath shingles with separate strips of (.015 inch)—(. . . . . inch) thick stainless steel built in with each course of shingle roofing. Where roof slope is 6 inches or more per foot, extend flashing pieces at least 9 inches under shingles adjoining valley intersection. Where roof slope is less than 6 inches per foot, extend flashing pieces at least 12 inches under shingles adjoining valley intersection. Each flashing piece shall be as long as the diagonal line of intersection of each shingle with the valley line. Nail upper edge of each flashing piece to roof sheathing or to wood nailing strips. Keep bottom edge of flashing ½ inch short of the shingle butt line.

20. METAL COVERING AND FLASHING OF EQUIPMENT SUPPORTS ON ROOFS:

(A) Cover raised bases and equipment supports on roofs, for fans and . . . . . with (.015 inch)—(. . . . . inch) thick stainless steel, (Type 302 or 304)–(Type . . . . .)—(2D finish)—(. . . . . finish) dead soft fully annealed. Fabricate the metal to shapes required and provide flanges extending out a minimum of 4 inches over built-up roofing; or member with metal roofing in a manner to provide watertight construction. Where the flashing is punctured for bolt connections, provide 4 pound sheet lead washers, 2 inches larger than the bolt holes.

21. METAL THROUGH-WALL FLASHING:

(A) Provide metal through-wall flashing under stone and . . . . . wall copings, under . . . . . sills and at other locations indicated. Flashings shall be formed of stainless steel (Type 302 or 304)–(Type. . . . .)—(2D finish)—(. . . . . finish) dead soft fully annealed. Typical flashings above roof line shall be (.010 inch)—(. . . . . inch) thick minimum. Typical flashings below roof line shall be (.006 inch)—(. . . . . inch) thick, min. Flashings shall be a prefabricated product similar to "." as manufactured by . . . . . ; it shall be especially formed to bond in the mortar bed, prevent lateral movement in both directions, and be free of breaks or perforations. Bonding features shall consist of a series of ribs, extending transversely or diagonally across the sheet, or by a small rolled pattern in the sheet surface. The bonding features shall be formed so as not to pocket water on the surface. Lap cross joints to interlock design pattern at least 3 inches. Stop typical flashing in mortar joint ½ inch from the exterior face of wall. Pointing of mortar joint is specified under Section "."

Where metal through-wall flashing connects with other metal flashing, provide a specially formed edge to engage the adjacent sheet. Flashings that form cap flashings shall turn down face of wall at least 4 inches, overlap base flashings not less than 4 inches and have bottom edge folded back ½ inch on under side.

22. MISCELLANEOUS FLASHINGS:

(A) Provide miscellaneous flashing for the items as listed below. Unless otherwise specified, fabricate flashings of (Type 302 or 304)—(Type . . . . .) stainless steel, (2D finish)—(. . . . . finish) dead soft fully annealed and of thickness indicated and specified. The forming and installation of flashings shall be as indicated on project drawings and in accordance with the applicable details and plate numbers listed in The SMACNA Manual.

(1) Flashing at Roof Penetrations: Use (.015 inch)—(. . . . . inch) thick stainless steel. Refer to Plates 58, 59, 60, 61 and 63.

(2) Chimney Flashing: Use (.015 inch)—(. . . . . inch) thick stainless steel. Refer to Plate 62.

(3) Ledge Flashing: Use (.015 inch)—(. . . . . inch) thick stainless steel. Refer to Plate 64.

(4) Flashing Shingle Roofs at Eaves, Rakes Ridges and . . . . . : Use (.015 inch)—(. . . . . inch) thick stainless steel. Refer to Plates 56, 57 and 66.

(5) Water Diverters: Use (.015 inch)—(. . . . . inch) thick stainless steel. Refer to Plate 24.

(6) Spandrel and Sill Flashing: Use (.006 inch)—(. . . . . inch) thick stainless steel with through-wall pattern. Refer to Plates 46 and 47.

23. GRAVEL STOPS AND FASCIAS.

(A) Provide gravel stops (and fascia) at exposed edges of all built-up roofs except . . . . . Fabricate gravel stops from (.015 inch)—(. . . . . inch) thick stainless steel, (Type 302 or 304)—(Type . . . . .) with a 2D finish)—(No. 4 finish)—(. . . . . finish). SEE NOTE 10

(B) Form gravel stops and fascias to sizes and details indicated and in 8, 10 or . . . . . foot units. Form corner sections by mitering and spot welding or riveting the flange and sealing with solder or sealant; or by a continuous weld on back side. Unless other methods are indicated, the joints between the units shall be made with a $\frac{3}{16}$ inch expansion joint between sheets and 6 inch wide back-up plates or cover plates formed to exact profile of gravel stop and fascia. Fill space between gravel stops and plates with an approved sealing compound and nail plates to deck or nailer at the $\frac{3}{16}$ inch expansion joint; (Refer to Plate 68 of The SMACNA Manual and to Fascia and Gravel Stop Details in The Stainless Steel Data Manual).

(C) Extend flanges of gravel stops out on top of built-up roofing felts not less than 3½ inches; secure flange to

wood nailers with No. 12 flat head, annular thread, stainless steel nails, 1 inch long; space nails 6 inches on center.

(D) Where gutters (other than half-round type) occur directly under a gravel stop, extend the gravel stops down into gutters at least 2 inches and fold the edges of stops back. Where the gravel stop extends down on vertical surface to form a finished fascia, hook the bottom edge over a previously-placed edge strip.

24. HANGING GUTTERS — RECTANGULAR TYPE:

SEE NOTE 11

(A) Provide rectangular type hanging gutters of size and shape indicated at eaves of ..... roofs. Fabricate gutters from (.015 inch)—(..... inch) thick stainless steel, (Type 302 or 304)—(Type .....) with 2D finish)—(..... finish). Form gutters in 8, 10 or ..... foot long sections; lap cross joints 1½ inches, rivet and solder or weld. Provide loose-locked expansion joints midway between all outlet tubes and where gutter ends adjoin masonry walls. Form expansion joints to provide for ½ inch movement in either direction. Fit joints with cover strips in a manner to provide watertight connections.

(B) Gutters shall be supported (by stainless steel spike and ferrule spaced 30 inches on center and in accordance with figure B on Plate 15)—(by overhead stainless steel straps .037 inch thick by ..... inch wide, spaced 30 inches on center and in accordance with figure ..... on Plate .....)—(by ⅛ inch thick by ..... inch wide, stainless steel gutter brackets spaced 30 inches on center and in accordance with details on Plate 13 or 14) of The SMACNA Manual. Reinforce outer edges of gutters when so indicated. When bottom of gutters are supported on brackets, provide spacers across top of gutter at approximately mid-point between brackets. Provide flashings or gutter extensions at roof edges as shown on details.

(C) Provide outlet tubes with flanges riveted and soldered to gutters; extend tubes 3 inches into downspouts. Set gutters level unless otherwise indicated.

25. HANGING GUTTERS — HALF ROUND TYPE:

SEE NOTE 11

(A) Provide half-round metal gutters of sizes indicated at eaves of ..... roofs. Fabricate gutters from (.015 inch)—(..... inch) thick stainless steel, (Type 302 or 304)—(Type .....) with a (2D finish)—(..... finish). Form gutters in 8, 10 or ..... foot long sections, to sizes and shapes indicated. Join sections by tongue-and-groove slip joints. Fill joints with a thick mixture of white lead paste or an approved sealing compound. Provide a rolled bead on (front side)—(each side) of gutters. Provide all necessary end pieces, caps, outlet tubes and miters; solder or weld and make watertight.

(B) Support gutters on hangers located near ends and spaced not over 30 inches apart. Gutters shall be set level unless otherwise indicated on drawings. Hangers, not shown or specified otherwise, shall be formed of 1 inch by (.037 inch)—(..... inch) thick stainless steel, extending 6 inches on roof boarding and fastened thereto with 2 countersunk stainless steel screws. Hangers for gutters of ..... shall be adjustable stock type stainless steel similar to type No. ..... as manufactured by .....

26. BUILT-IN GUTTERS:

SEE NOTE 11

(A) Install built-in gutters at ..... Cover surface under gutter lining with roofing felt and cover felt with building paper as hereinbefore specified. Fabricate gutter lining of (.018 inch)—(..... inch) thick stainless steel sheets, (Type 302 or 304)—(Type .....)—(2D finish)—(..... finish) dead soft fully annealed. The metal sheets shall conform to profile of gutter; longitudinal seams will not be permitted. Make cross seams 48 inches apart where sectional contour is more than 36 inches and 8 feet apart where sectional contour is 36 inches or less. Join ends of sheets together by ¾ inch lock and soldered seams.

(B) Provide loose-locked expansion joints midway between all outlet tubes and where ends of gutters abut masonry or ..... walls. Form expansion joints to provide for ..... inch movement in either direction; fit joints with cover strips in manner to provide free movement and watertight connection. Form expansion joints as indicated on Plates 6, 9 and 10 of The SMACNA Manual. (Refer to Plates 4 and 6 for gutter design and allowance for expansion)—(refer to Chart 7 on Plate 4 for recommended metal gauges.)

(C) Where built-in gutters occur at shingle type roofs, extend roof edge of gutter lining under the ..... roof shingles not less than 6 inches and terminate in a folded edge. A separate apron strip of stainless steel, not less than 6 inches wide shall be loose-locked into the folded edge of gutter lining. Nail upper edge of apron to roof boarding at 4 inch centers. Do not pierce gutter lining with nails.

(D) Where built-in gutters occur at metal roofs, extend roof edge of gutter lining under metal roofing not less than 6 inches, terminate in a folded edge and attach to roof boarding by cleats at 24 inch centers. Provide a continuous lock strip, the same material as gutter lining, and solder to gutter lining at lower ends of roofing sheets. Connect roofing metal to lock strip with a loose-lock joint.

(E) Terminate the outer edge of gutter lining over top of cornice as detailed and in accordance with Plate No. ..... of The SMACNA Manual.

(F) Form outlet tubes of same material as gutter lining, with lock and soldered longitudinal seam. Upper end of tube shall be flanged, riveted and soldered to lining. Ex-

tend tubes into downspouts at least 3 inches.

27. DOWNSPOUTS:

(A) Provide metal downspouts on outside walls from gutters, leader heads, scuppers and ..... as indicated. Fabricate downspouts from (.015 inch)—(..... inch) thick, (Type 302 or 304)—(Type .....) stainless steel with a (2D finish)—(..... finish). Form downspouts to sizes indicated, in 8 to 10 foot lengths. Telescope end joints 1½ inches and lock longitudinal joints. Fasten downspouts to walls with (.018 inch)—(..... inch) thick stainless steel straps, 3 inches wide or concealed clamp supports of stainless steel as manufactured by ..... Space straps or clamps not more than 8 feet apart. Provide a shoulder of solder on each side of downspout above each strap; fasten straps to walls with stainless steel screws in plastic sleeves, or .....

(B) Form downspout conductor heads to design indicated. Lock, and solder or weld without flux all seams. Close tops of downspout heads with a removable type ½ inch mesh stainless steel wire screen.

(C) Where downspouts empty onto splash blocks or roof pans, provide elbows at bottom. Fit downspouts into cast iron boots or drain pipes where indicated and caulk with cement.

(D) Where downspouts empty onto built-up roofs, provide metal splash pans of .015 inch thick stainless steel with a 2D finish. The size and shape of splash pans shall be in accordance with Plate 35 of The SMACNA Manual. Embed pans in hot bitumen.

28. SCUPPER LININGS:

(A) Line scuppers with (.015 inch)—(..... inch) thick stainless steel (Type 302 or 304)—(Type .....) with a (2D Finish)—(..... finish) dead soft fully annealed. Extend lining through walls and project into downspout conductor heads or into ..... Join scupper linings with roof flashings by full soldered, or welded seams. On built-up roofs with gravel or slag surfacing, provide a ¾ inch high gravel stop across scupper opening. Scupper design shall be (as indicated on drawings)—(in accordance with details shown on Plate No. ..... of The SMACNA Manual).

29. STRAINERS:

(A) Provide in each gutter outlet to downspout a removable basket type wire strainer. Construct strainers of $\frac{1}{16}$ inch diameter stainless steel wire. Fit strainers snugly into outlets.

30. FORMED METAL COPINGS:

(A) Cover top of masonry and ..... parapet walls where indicated with (.018 inch)—(..... inch) thick stainless steel coping formed to design shown. Stainless steel shall be (Type 302 or 304)—(Type .....) with a (2D finish)—(..... finish). Before applying metal, cover top of wall or wood blocking with felt and paper as hereinbefore specified. Unless other methods are indicated, the cross joints between coping sheets shall be made with a $\frac{3}{16}$ inch expansion joint between sheets and 6 inch wide back-up plates or cover plates formed to profile of coping. Fill space between coping and plates with an approved mastic or sealant. The method of forming cross joints in coping shall be (in accordance with details on Plate 68, Alternate 4 and 5 of the SMACNA Manual)—(as indicated for coping details in The Stainless steel Data Manual)—(as detailed on project drawings).

(B) Front edge of coping covering shall extend down over and lock into a previously placed continuous edge strip of stainless steel; use .025 inch thick edge strip when securing to wood blocking and .037 inch thick edge strip when securing to masonry. Secure edge strips to wood with nails spaced 6 inches apart and to masonry with stainless steel screws in expansion shields and spaced 12 inches apart.

(C) Rear edge of coping covering shall be (terminated as indicated on project drawings and on Plate .....)—(joined to adjacent flashing as indicated on project drawings and by details on Plate .....) of The SMACNA Manual.

(D) All corners of coping shall be mitered, seamed and sealed with solder.

31. BUILDING EXPANSION JOINTS:

(A) JOINTS IN WALLS: At expansion joints in exterior walls, provide accordion type water stops of (.015 inch)—(..... inch) thick, stainless steel (Type 302 or 304)—(Type .....) with a 2D finish, dead soft fully annealed. Joints shall be formed as indicated (on the project drawings)—(on Plate 82 of The SMACNA Manual). Form water stops in 8, 10 or ..... foot lengths and provide them continuously from the top of walls to the top of footings. Lap joints 4 inches in the direction of water flow; solder, or weld all joints below grade. Fit joints closely, but with ample provision for expansion and contraction. Provide a folded edge on each flange and build the flange 4 inches into masonry.

(B) JOINTS IN ROOF: At exposed top surfaces of expansion joints on roofs and ..... form expansion covers of (.015 inch)—(..... inch) thick stainless steel with a 2D finish)—(..... finish). Joints shall be formed as indicated (on the project drawings)—(on Plate ..... of The SMACNA Manual.) Fabricate the covers in sections not more than 10 feet long; lap joints 3 inches. Fit joints closely and form them to be watertight, but with ample provision for expansion

and contraction. Exposed edges of joint covers shall overlap the flashings at least 4 inches and be turned under a continuous strip of stainless steel. Form continuous strips of .025 inch thick stainless steel or of .015 inch thickness bent double; fasten strips in place with stainless steel screws spaced not more than 12 inches on centers. Screw fastenings in masonry or concrete shall be in lead or ..... shields. At contractor's option, covers for expansion joints may be a combination of stainless steel and neoprene as (indicated on Plate 79, figure ..... in the SMACNA Manual)—(detailed on project drawings and as manufactured by .....).

32. FORMED METAL LOUVERS — STATIONARY TYPE:

SEE NOTE 12

(A) Provide stationary type formed sheet metal louvers of sizes indicated in exterior walls of ..... and for interior walls in.....

(B) Construct louvers and frames of (Type 302 or 304)—(Type .....) stainless steel with a (2D finish)—(..... finish). Unless otherwise indicated, the minimum metal thickness for louver blades and frames shall be .025 inch for louvers up to 24 inches wide; .031 inch for louvers 25 to 36 inches wide; .037 inch for louvers 37 to 48 inches wide and .050 inch for louvers 49 to 60 inches wide. (Where louver blades exceed 36 inches in width, a ⅛ by 1 inch stainless steel bar (may)—(shall) be used to connect the louver blades; where bar connectors occur, fabricate louver blades from ..... inch thick stainless steel).

(C) Form louver blades (to shapes indicated on project drawings) —(to shapes indicated on Plate No. ..... and Figure No. ..... of The SMACNA Manual); set blades level and space accurately. At corners and intersections, lap metal, rivet and solder or weld. Provide vertical mullions where indicated or where the unsupported length of louver blades between jambs exceeds ..... inches. Construct louver as a unit so it can be inserted in wall openings and the frame anchored to walls and/or sub-frame as indicated on the approved shop drawings.

(D) Provide metal collars of sheet ..... where ducts are to be connected to louvers. Provide a removable screen on (outside)—(inside) of louvers. Fabricated screen frame of ..... inch thick stainless steel of same finish as louver; where louvers are connected to ducts, use (¼ inch)—(½ inch) mesh stainless steel wire screens; for louvers not connected to ducts use 16 by 16 or 14 by 18 mesh stainless steel wire screens.

33. ROOF SCUTTLES — ACCESS TYPE:

(A) Provide roof scuttles at locations indicated for access to roof areas. Scuttles shall be prefabricated type similar to Model No. ..... as manufactured by ..... and of sizes shown. Furnish scuttles complete with curbs, flashings cover, compensating spring hinges, lifting handles, automatic lock bar, spring latch with padlock lug, 1-inch (fiberboard)—(cork) insulation on cover and on curbs, neoprene draft stops and other appurtenances as required for a complete installation. Metal for cover, curbs and flashings shall be stainless steel (Type 302 or 304)—(Type .....) with a 2D finish; use ..... inch thick metal for cover, ... inch thick metal for curbs and ..... inch thick metal for counter flashings.

34. ROOF VENTILATORS:

(A) Roof ventilators shall be (directional)—(stationary)—(revolving)—(gravity) type of sizes shown, similar to Model No. ..... as manufactured by ..... Construct ventilators of ..... inch thick stainless steel with a (2D finish)—(..... finish). Ventilators shall be weather-proof under all conditions and braced properly to provide rigid construction. Provide substantial bases complete with flashing flanges. Provide manually-operated dampers, except where specified otherwise. Ventilators shall be provided with ½ inch mesh woven wire bird screens. Wire shall be stainless steel with 0.0475 inch minimum diameter. Install screens on the exterior of frames so they are readily removable for cleaning. Anchor ventilators to curbs, decking, framing, or ..... and flash to provide watertight construction.

35. METAL COVER FOR TOP OF INCINERATOR AND BOILER STACKS:

(A) The top of masonry stacks for (incinerators)—(boiler flues)—(.....) shall be covered with (.025 inch)—(.031 inch) thick stainless steel Type 316 with a (2D finish)—(..... finish). The cover shall be formed as detailed with watertight locked and soldered seams except that expansion seams shall be provided at approved locations and as indicated on approved shop drawings. Where the cover turns down around outside edges of stack and on inside of flue it shall be locked under a continuous edge strip of .031 inch stainless steel; fasten edge strip to the masonry with stainless steel screws spaced not more than 6 inches on centers and in lead shields. (On incinerator tops where metal spark arrestor screens are required, the connections between the screens and metal cover shall be as detailed on approved shop drawings).

36. CLEANING STAINLESS STEEL:

(A) Upon completion of soldering operations for each area or item, all flux residue shall be removed from the stainless steel surfaces. Remove residue by swabbing areas with a solution of washing soda or ammonia, scrubbing and then rinsing with clear water. Use particular care to remove residue from any crevices.